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Board Approved

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South Dakota Department of Education

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INTRODUCTION/OVERVIEW

PREFACE

These Mathematics Standards are set forth to ensure graduates of South Dakota's public schools have the knowledge, skills, and competencies essential to leading productive, fulfilling, and successful lives as they continue their education, enter the workforce, and assume their civic responsibilities.

In 1997, the South Dakota State Legislature passed SB170 that amended South Dakota Codified Law 13-3-48 to address the issue of challenging state content standards. The adopted amendment reads as follows: "The Secretary of the Department of Education and Cultural Affairs [now the Department of Education] shall prepare and submit for approval of the South Dakota Board of Education academic content standards in language arts, mathematics, social studies, and science for grades one through twelve. Each school district shall adopt and implement clearly defined and measurable course guidelines so as to meet the state academic content standards."

With input from students, parents, teachers, and communities of South Dakota, the Standards Committee was charged with revision of the current South Dakota Content Standards and Performance Descriptors. The final document evolved from recent research in best practices in teaching, the **No Child Left Behind** legislation, experience in classrooms with the existing South Dakota Content Standards, the evolution of published standards from other states, the National Council of Teachers of Mathematics (NCTM) Standards, and National Assessment of Educational Progress (NAEP) Frameworks and descriptors, numerous professional publications, and lengthy discussions by experienced kindergarten through grade sixteen, South Dakota educators.

The content students need to acquire at each grade level is stated explicitly in these standards. With student mastery of this content, South Dakota schools will be competitive with the best educational systems in other states and nations. The standards are comprehensive and specific, they are rigorous, and they represent South Dakota's commitment to excellence. The standards are firm but not unyielding; they will be modified in future years to reflect new research and scholarship.

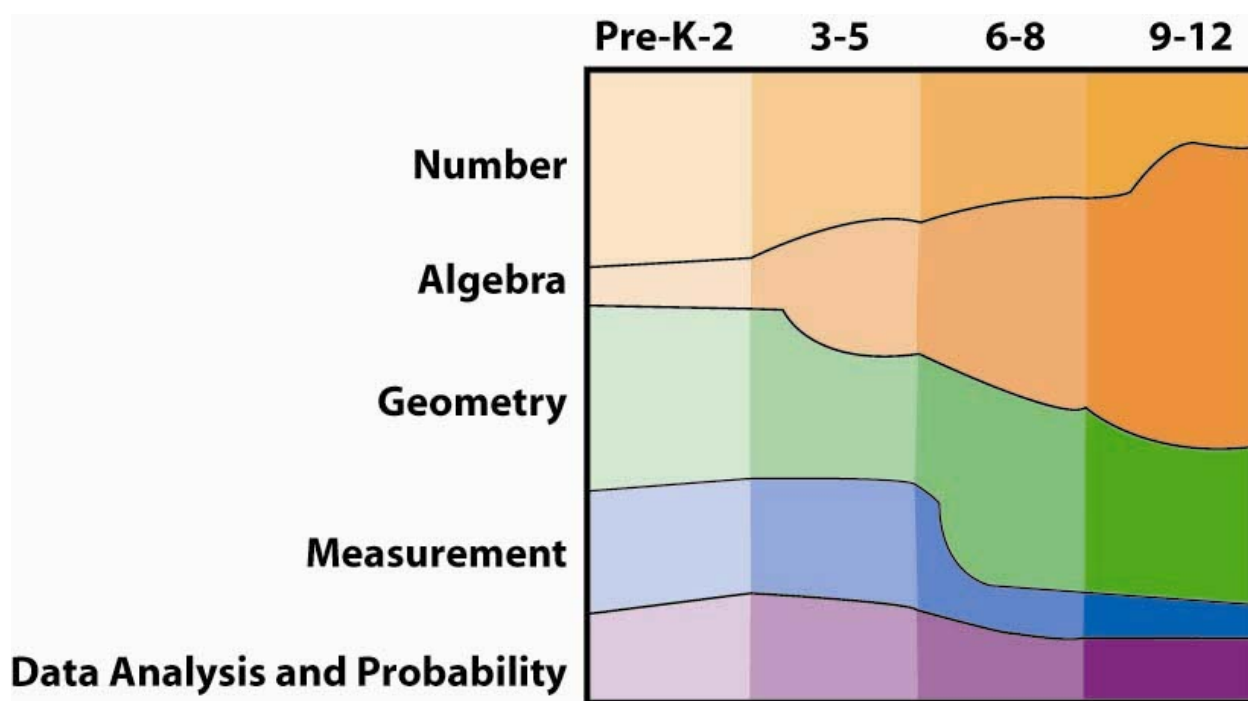
THE PURPOSE OF THE SOUTH DAKOTA STANDARDS DOCUMENT

The South Dakota standards provide a listing of essential core content to be taught and learned. The standards are designed to guide the planning of instruction and to anchor the assessment of learning from kindergarten through twelfth grade. Performance descriptors bridge the content standards to assessments of the standards, provide information to teachers and students regarding student progress toward mastery of the standards, and give them specific targets for instruction and learning. The document presents a starting point for informed dialogue among those dedicated and committed to quality education in South Dakota. By providing a common set of

goals and expectations for all students in all schools, this dialogue will be strengthened and enhanced.

KEY CONSIDERATIONS FOR STANDARDS DEVELOPMENT

As students move from kindergarten through grade 12, levels of cognitive demand and complexity of content, skills, and processes increase. New skills emerge and basic skills are subsumed within more advanced skills as students progress through the grades. The NCTM *Principles and Standards for School Mathematics* (2002) illustration below graphically demonstrates this process of emerging and subsuming skills in the following way.



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Furthermore, based on information available through national standards work and developmental research, consideration has been given in these standards to the developmental appropriateness of skills required at each grade level. In consideration of developmental appropriateness, the committee has provided emphasis in each grade span as follows.

- Kindergarten through grade 2 standards emphasize numbers and their relationships, operations, place value, and attributes of shapes.
- Grades 3 through 5 standards emphasize multiplicative reasoning, equivalence, and computational fluency with whole numbers.

- Grades 6 through 8 standards emphasize linear equations in algebra, linear relationships and similarities in geometry, proportionality, and connections between algebra and geometry.
- Grades 9 through 12 standards emphasize new classes of functions, new geometric perspectives, new ways of analyzing data, and justifying mathematical reasoning.

Grade-level standards specify what students should know and be able to do by the end of each grade level, while curriculum specifies what teachers will teach. Because standards are not curriculum, the review embedded in curriculum does not appear from grade to grade across grade-level standards. Teachers are charged with introducing skills in earlier grades before mastery is expected and with reviewing skills students will need to use in mastering the grade-level standards. Teachers and researchers have learned that in order for students to demonstrate mastery of skills specified in the standards on summative (end-of-year) assessments, **teachers must teach and students must learn at a level of fluency that exceeds the apparent expectations of the grade-level standard.** For this reason, teachers must be aware of and skilled in teaching the content, skills, and processes described in standards immediately below and above as well as at their own grade-level assignment.

FORMAT OF THE STANDARDS DOCUMENT

Standards

The standards are the targets all students need to meet at the proficient level by the end of each grade level. The standards are presented in two formats. The first format organizes the standards by grade level so a student, parent, classroom teacher, administrator, or local school board member can quickly review what learning is expected at each specific grade. The Bloom's Taxonomy level of cognitive challenge is listed in the standards document to make clear the level at which each standard should be assessed.

At grades 9 through 12, schools teach skills and courses in a variety of configurations to accommodate students and school personnel, especially in rural settings. For this reason, the grade-level standards are grouped into core and advanced standards. The core high school standards all students are expected to meet by graduation include topics of first year algebra and geometry. The advanced high school standards apply to students who have completed the core standards and choose an advanced mathematics curriculum. Students who plan to attend post-secondary educational institutions should complete mathematics courses reflected in the advanced standards. Taking rigorous mathematics courses will be important to success in post-secondary educational studies.

All standards in each grade level and the core standards for high school need to be met at the proficient level by the time students are tested for these skills on the state assessments. For early grades not assessed on the state assessments, students need to master the standards at each grade level in order to be adequately prepared to meet the next grade-level standards and subsequently, to achieve the proficient level at the grade levels tested.

The standards are also provided in a side-by-side format so the alignment of standards from grade to grade is immediately apparent. This section of the document contains content goals,

indicators, grade-level standards, and performance descriptors. Each has a role in shaping the expected outcomes for South Dakota students.

- **Goals and indicators** are the common threads that represent expected outcomes for all students preparing to graduate from South Dakota schools.
- **Grade-level content standards** represent expected outcomes for students completing each grade level.
- **Grade-level supporting skills** represent enabling skills students may need to be taught in order to achieve the standards. Those identified by a (•) bullet are enablers to the specific grade-level standard. Those identified by a checkmark (✓) are enablers to the next higher grade-level standards that are related to current grade-level standards and thus may be introduced at an earlier time.
- **Examples** represent some possible materials, activities, or sub-skills classroom instructors could use in teaching the standards or supporting skills. Examples are not provided where the meaning of the standard should be evident to the reader. While the intention of providing examples is to clarify what is intended in terms of the complexity and level of challenge of the standard, these examples do not represent actual test items that will appear on the assessment.

Performance Descriptors

The performance descriptors are organized into proficiency levels. These proficiency levels describe how a student at that level would be expected to perform the grade-level standards. To identify increasing proficiency in mathematics, the levels are labeled as follows:

- **Advanced:** A student performing at the advanced level exceeds expectations for that grade level. The student is able to perform the content standards for the grade at a high level of difficulty, complexity, or fluency beyond that specified by the grade-level standards.
- **Proficient:** A student performing at the proficient level meets expectations for that grade level. The student is able to perform the content standards for the grade at the level of difficulty, complexity, or fluency specified by the grade-level standards.
- **Basic:** A student performing at the basic level performs below expectations for that grade level. The student is able to perform some of the content standards for the grade below the level of difficulty, complexity, or fluency specified by the grade-level standards.

A student performing below the basic level is unable to perform the content standards for the grade. Therefore, no description is provided below the basic level.

ADDITIONAL RESOURCES

Since this document uses appropriate mathematics terminology, a reader may occasionally encounter an unfamiliar term. In order to assist the reader with terminology used in this document, a **glossary** has been written with specific definitions to clarify intended meaning.

A **resource list** is provided in the appendix as a sampling of possible information sources. Because new resources are constantly becoming available, this list is intended to be neither an exhaustive nor a required list of resources.

A MESSAGE TO TEACHERS, PRINCIPALS, SUPERINTENDENTS AND OTHERS WHO WILL USE THE DOCUMENT

The Standards Committee was made up of a group of K-16 teachers who pooled their thoughts and experiences to provide a starting place for reaching South Dakota's goal: each student performing to at least the proficient level.

A set of standards is simply a place to begin—it lays the foundation for measurable, consistent, high-level student learning; however, teachers must consider the needs of their individual students and select the methods that will work best for their classrooms. Examples and lists of supporting skills have been provided to clarify but not limit the meaning of the standards. ***The curriculum of each district must provide students with rigor and topics beyond those of the standards in order to ensure mastery.***

Clearly, there is more to teaching and learning than these standards. Adjustments will need to be made for those students who exceed the standards and for those who cannot easily meet them. The standards are a starting point in creating an environment where students can learn to live and thrive in a constantly changing, increasingly complex world.

IMPORTANT NOTE TO TEACHERS: Not every supporting skill presented in this document needs to be taught in order for students to master that standard. This is also true for the examples that appear in this document. Supporting skills and examples are provided only to illustrate the standard, and are not designed as requirements to be taught.

CONCLUSION

South Dakota's students must grow progressively in their mastery of mathematical concepts and applications. They will need a wide repertoire of mathematics skills to succeed as learners, workers, and citizens in the 21st century. The ultimate purpose of the Mathematics Content Standards is to ensure that all students are offered the opportunities, the encouragement, and the vision to develop the mathematics skills they need to pursue lifelong goals, including participating as fully functioning members of society.

Mathematics Standards

K-12

Goals and Indicators

ALGEBRA STANDARDS

Goal 1: Students will use the language of algebra to explore, describe, represent, and analyze number expressions and relations that represent variable quantities.

An understanding of patterns is basic to all mathematical thinking. Early experiences in learning about, understanding, and using patterns is foundational to algebraic reasoning. This algebraic reasoning encompasses the relationships among quantities, the use of symbols, the modeling of phenomena, and the mathematical study of change. From investigations of the properties of whole numbers to the use of mathematical models to represent quantitative relationships, algebra is linked to all areas of mathematics. A strong foundation in algebra is an expectation for every South Dakota high school graduate.

Indicator 1: *Use procedures to transform algebraic expressions.*

Indicator 2: *Use a variety of algebraic concepts and methods to solve equations and inequalities.*

Indicator 3: *Interpret and develop mathematical models.*

Indicator 4: *Describe and use properties and behaviors of relations, functions and inverses.*

GEOMETRY STANDARDS

Goal 2: Students will use the language of geometry to discover, analyze, and communicate geometric concepts, properties, and relationships.

Spatial sense is fundamental to mathematics both as a means of interpreting and representing the physical environment, and as a tool for the study of other topics in mathematics and science. The study of relationships among shapes and their properties is essential to their representation in abstract form and their translation into definitions, theorems, and proofs. The study of geometry allows students to use visualization, spatial reasoning, and geometric modeling to solve problems.

Indicator 1: *Use deductive and inductive reasoning to recognize and apply properties of geometric figures.*

Indicator 2: *Use properties of geometric figures to solve problems from a variety of perspectives.*

MEASUREMENT STANDARDS

Goal 3: Students will apply systems of measurement and use appropriate measurement tools to describe and analyze the world around them.

The study of measurement is essential to an understanding of the measurable attributes of objects and the units, systems, and processes of measurement that are used in personal and professional work. In the early grades, students learn to use these measurable attributes of objects to compare them for relative length, weight, and other characteristics. Students increase their precision in collecting information about the measurable attributes of objects as they encounter increasing demands for these skills. Measurement skills and the accurate use of measurement tools and formulas become critical in other mathematical applications including geometry and statistics.

Indicator 1: Apply measurement concepts in practical applications.

NUMBER SENSE STANDARDS

Goal 4: Students will develop and use number sense to investigate the characteristics of numbers in a variety of forms and modes of operation.

Number sense is the most basic skill of mathematics. From simple counting to the fluent use of computations skills, students use number sense to operationalize mathematics. An understanding of basic mathematics operations is critical to all other mathematical pursuits. Students should exhibit fluency in applying number sense to mathematical operations by the end of the elementary years. Students should be able to perform computation through mental calculation, estimation, and paper-pencil calculations.

Indicator 1: Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers.

Indicator 2: Apply number operations with real numbers and other number systems.

Indicator 3: Develop conjectures, predictions, or estimations to solve problems and verify or justify the results.

STATISTICS & PROBABILITY STANDARDS

Goal 5: Students will apply statistical methods to analyze data and explore probability for making decisions and predictions.

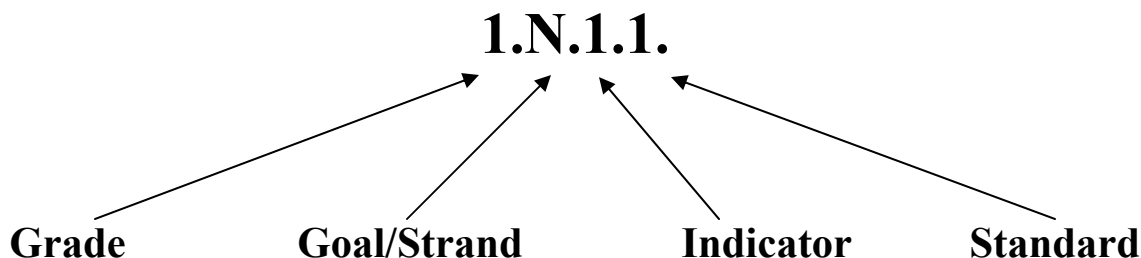
Statistics are encountered in every public forum from newspapers to consumer and employment data. The ability to define and investigate statistical questions and the probability of outcomes is essential to informed consumer decision-making. Students need the skills necessary to analyze and evaluate the barrage of statistical information they will encounter in their personal and professional lives. Through experiences in collecting and analyzing data, students learn to interpret and evaluate the usefulness of information.

Indicator 1: Use statistical models to gather, analyze, and display data to draw conclusions.

Indicator 2: Apply the concepts of probability to predict events/outcomes and solve problems.

Guide to the Numbering and Symbol System Used in the Document

Standards are coded to cross-reference grades, goals/strands, indicators, and standards.



Grade refers to the grade level at which the standards are to be mastered by students.

Goal or Strand refers to the major area of mathematics (e.g., algebra, geometry, measurement, number sense, statistics and probability) this group of standards address. These strands are coded:

A for Algebra

G for Geometry

M for Measurement

N for Number Sense

S for Statistics and Probability

Indicator refers to the number of the indicator for this goal or strand. Each goal has one or more related indicators that describe key aspects of the goal.

Standard refers to the number of the grade-level standard for the indicator. Each indicator has one or more grade-level standard(s) that describes what students will know and be able to do related to the indicator at the specific grade level.

Examples in bold type are directly related and aligned to the level of the standard. These examples represent the level of difficulty intended in the grade-level standard and possible materials, activities, or sub-skills classroom instructors could use in teaching the standards.

Grade-level supporting skills represent enabling skills students may need to be taught in order to achieve the standards.

(●) **Bullets** represent enabling skills to the current grade-level standard students may need to be taught in order to achieve the standards.

(√) **Checkmarks** are enabling skills to the next higher grade-level standards that are related to current grade-level standards and thus may be introduced at an earlier time.

Examples that are NOT in bold type are related and aligned to the level of the bullets/supporting skills and checkmarks. These examples represent the level of difficulty intended in the grade-level standard. They represent some possible materials, activities, or sub-skills classroom instructors could use in teaching the supporting skills.

SOUTH DAKOTA MATHEMATICS STANDARDS

K-2

Kindergarten Algebra Grade Standards, Supporting Skills, and Examples

Indicator 1: Use procedures to transform algebraic expressions.

Note: Kindergarten students do not master standards for Indicator 1. Mastery of this indicator emerges and increases from grade 3 upward.

Indicator 2: Use a variety of algebraic concepts and methods to solve equations and inequalities.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	K.A.2.1. Students are able to compare collections of objects to determine more, less, and equal (greater than and less than). <ul style="list-style-type: none">Demonstrate mastery using collections of concrete objects. Example: Are there more red marbles or blue marbles in the jar?

Indicator 3: Interpret and develop mathematical models.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Knowledge)	K.A.3.1. Students are able to use concrete objects to model the meaning of the "+" and "-" symbols. <ul style="list-style-type: none">Model problem situations using physical materials. Example: Mary had 2 crackers and Steve had 2 crackers. How many crackers did they have together? Example: Bob had 5 apples and he ate 1 apple. How many apples does he have left?

Indicator 4: Describe and use properties and behaviors of relations, functions, and inverses.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Knowledge)	K.A.4.1. Students are able to identify and extend two-part repeating patterns using concrete objects. Example: Green triangle, orange square, green triangle,___? Example: Tennis shoe, tennis shoe, sandal,___?
(Comprehension)	K.A.4.2. Students are able to sort and classify objects according to one attribute. Example: size, shape, or color.

**Kindergarten Algebra
Performance Descriptors**

Advanced	Kindergarten students performing at the advanced level: <ul style="list-style-type: none"> • recognize and use the plus and minus symbols; • compare, sort, and classify objects; • extend and/or create two-part repeating patterns.
Proficient	Kindergarten students performing at the proficient level: <ul style="list-style-type: none"> • recognize the plus and minus symbols; • compare, sort, and classify sets of objects based on one attribute; • extend two-part repeating patterns.
Basic	Kindergarten students performing at the basic level: <ul style="list-style-type: none"> • sort sets of objects based on one attribute; • recognize patterns.

**Kindergarten Geometry
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Use deductive and inductive reasoning to recognize and apply properties of geometric figures.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Knowledge)	<p>K.G.1.1. Students are able to identify basic two-dimensional (plane) figures.</p> <ul style="list-style-type: none"> Describe their likeness and differences and identify them in the environment. <p>Examples:</p> <p>Circle</p> <p>Square</p> <p>Triangle</p>

Indicator 2: Use properties of geometric figures to solve problems from a variety of perspectives.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>K.G.2.1. Students are able to describe the position of two-dimensional (plane) figures.</p> <p>Examples: Above, between, next to, below, beside</p>

**Kindergarten Geometry
Performance Descriptors**

Advanced	<p>Kindergarten students performing at the advanced level:</p> <ul style="list-style-type: none"> identify, describe, and draw plane figures and find examples in the environment; identify shapes that have been translated (slid.)
Proficient	<p>Kindergarten students performing at the proficient level:</p> <ul style="list-style-type: none"> identify and describe plane figures and find examples in the environment.
Basic	<p>Kindergarten students performing at the basic level:</p> <ul style="list-style-type: none"> identify plane figures.

**Kindergarten Measurement
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Apply measurement concepts in practical applications.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Knowledge)	K.M.1.1. Students are able tell time to the nearest hour using digital and analog clocks.
(Knowledge)	K.M.1.2. Students are able to name the days of the week.
(Knowledge)	K.M.1.3. Students are able to identify pennies, nickels, dimes, and quarters using money models.
(Knowledge)	K.M.1.4. Students are able to estimate length using non-standard units of measure. Example: A book is about ____ paperclips long.
(Comprehension)	K.M.1.5. Students are able to compare and order concrete objects by length, height, and weight. Examples: Length - longer, shorter Height - taller, shorter Weight – heavier, lighter

**Kindergarten Measurement
Performance Descriptors**

Advanced	Kindergarten students performing at the advanced level: <ul style="list-style-type: none"> • estimate length of concrete objects using non-standard or standard units; • compare and order length, height, and weight of concrete objects using non-standard and standard units; • state the value of coins; • tell time to the nearest half hour.
Proficient	Kindergarten grade students performing at the proficient level: <ul style="list-style-type: none"> • estimate length of concrete objects using non-standard units; • compare and order length, height, and weight of concrete objects using non-standard units; • identify coins; • tell time to the nearest hour and name the days of the week.
Basic	Kindergarten grade students performing at the basic level: <ul style="list-style-type: none"> • estimate length and height of concrete objects using non-standard units; • explain the purpose of money; • read the numbers on a digital clock.

**Kindergarten Number Sense
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>K.N.1.1. Students are able to read, write, count, and sequence numerals to 20.</p> <ul style="list-style-type: none"> • Say the forward number word sequence to 20 and the backward number sequence from 10. • Say the number before and after a given number in the range 0-20. • Use one-to-one correspondence. • Keep track of what's been counted. • Associate verbal names and standard numerals with whole numbers to 20. • Count objects in a given set and write the corresponding numeral. • Identify ordinal positions using an ordered set of objects, 1st through 10th. <p>✓ <i>Associate written word names with whole numbers to 10.</i></p>
(Knowledge)	<p>K.N.1.2. Students are able to use fraction models to create one half of a whole.</p> <p>Example: Divide a cookie equally between two people.</p>

Indicator 2: Apply number operations with real numbers and other number systems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	(Mastery of this indicator does not emerge until first grade.)

Indicator 3: Develop conjectures, predictions, or estimations to solve problems and verify or justify the results.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>K.N.3.1. Students are able to solve addition and subtraction problems up to 10 in context.</p> <ul style="list-style-type: none"> • Represent problem situations and solve using concrete objects, pictures, or numbers. • Explain how to solve story problems using concrete objects and pictures.

**Kindergarten Number Sense
Performance Descriptors**

Advanced	<p>Kindergarten students performing at the advanced level:</p> <ul style="list-style-type: none"> • estimate and solve addition and subtraction problems up to 20; • read, write, count, and sequence numerals to 50; • identify unit fractions of a whole.
Proficient	<p>Kindergarten students performing at the proficient level:</p> <ul style="list-style-type: none"> • solve addition and subtraction problems up to 10; • read, write, count, and sequence numerals to 20; • create one half of a whole.
Basic	<p>Kindergarten students performing at the basic level:</p> <ul style="list-style-type: none"> • read, write, and count numerals to 10; • solve addition and subtraction problems up to 5.

Kindergarten Statistics & Probability
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use statistical models to gather, analyze, and display data to draw conclusions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Knowledge)	K.S.1.1. Students are able to describe data represented in simple graphs (using real objects) and pictographs. Example: Using a graph of favorite ice cream flavors, decide which flavor most people like.

Indicator 2: Apply the concepts of probability to predict events/outcomes and solve problems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
	(Mastery of this indicator does not emerge until first grade.)

Kindergarten Statistics & Probability
Performance Descriptors

Advanced	Kindergarten students performing at the advanced level: <ul style="list-style-type: none"> • answer questions about collected data; • construct simple graphs from collected data.
Proficient	Kindergarten students performing at the proficient level: <ul style="list-style-type: none"> • describe and compare observable quantities of collected data; • interpret data represented in pictographs and bar graphs.
Basic	Kindergarten students performing at the basic level: <ul style="list-style-type: none"> • identify which group has the most in a set of collected data.

First Grade Algebra
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use procedures to transform algebraic expressions.

Note: First grade students do not master standards for Indicator 1. Mastery of this indicator emerges and increases from grade 3 upward.

Indicator 2: Use a variety of algebraic concepts and methods to solve equations and inequalities.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>1.A.2.1. Students are able to use the concepts and language of more, less, and equal (greater than and less than) to compare numbers and sets (0 to 20).</p> <ul style="list-style-type: none"> For numbers 0 - 20, identify one more/one less. Write the words less than or more than between two numbers. Example: 18 is more than 4 Identify a number that is more than/less than a given number.
(Application)	<p>1.A.2.2. Students are able to solve open addition and subtraction sentences with one unknown (\square) using numbers equal to or less than 10.</p> <p>Examples:</p> $4 = 3 + \square$ $\square + 2 = 4 + 1$ $5 - 3 = \square$ $1 = \square - 2$

Indicator 3: Interpret and develop mathematical models.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>1.A.3.1. Students are able to write number sentences from problem situations using “+” or “-”, and “=” with numbers to ten.</p> <p>Examples: Write a number sentence to represent the problems.</p> <p>1) Mary had 8 cookies. She gave 2 cookies to Bob. How many cookies does she have left?</p> <p>2) Mary has 8 cookies. Bob has 2 cookies. How many cookies do</p>

	they have altogether?
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Indicator 4: Describe and apply the properties and behaviors of relations, functions, and inverses.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	1.A.4.1. Students are able to identify and extend repeating patterns containing multiple elements using objects and pictures. <ul style="list-style-type: none"> Describe or demonstrate the next element in repeating patterns, e.g., rhythm, color, and shape. Find patterns or relations in data organized in tables or charts to determine what should come next.
(Comprehension)	1.A.4.2. Students are able to determine common attributes in a given group and identify those objects that do not belong.

**First Grade Algebra
Performance Descriptors**

Advanced	First grade students performing at the advanced level: <ul style="list-style-type: none"> create and solve addition and subtraction number sentences (0-20); compare numbers and sets (1-20) and explain their thinking; extend and create repeating patterns.
Proficient	First grade students performing at the proficient level: <ul style="list-style-type: none"> solve addition and subtraction number sentences (0-10); compare numbers and sets (1-20); identify and extend repeating patterns.
Basic	First grade students performing at the basic level: <ul style="list-style-type: none"> solve addition number sentences (0-5); identify repeating patterns.

First Grade Geometry
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use deductive and inductive reasoning to recognize and apply properties of geometric figures.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	1.G.1.1. Students are able to describe characteristics of plane figures. Examples: A circle is round. A triangle has three straight lines.
(Comprehension)	1.G.1.2. Students are able to sort basic three-dimensional figures. Examples: Sphere Cube Cylinder Cone

Indicator 2: Use properties of geometric figures to solve problems from a variety of perspectives.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	1.G.2.1. Students are able to describe proximity of objects in space. Examples: Near, far, up, down, below, beside

**First Grade Geometry
Performance Descriptors**

Advanced	First grade students performing at the advanced level: <ul style="list-style-type: none">• compare plane and solid figures based on observable characteristics;• describe proximity of objects in space based on more than one attribute;• identify geometric figures regardless of orientation.
Proficient	First grade students performing at the proficient level: <ul style="list-style-type: none">• describe characteristics of plane figures;• sort solid figures;• describe proximity of objects in space.
Basic	First grade students performing at the basic level: <ul style="list-style-type: none">• recognize plane figures;• recognize proximity of objects in space.

**First Grade Measurement
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Apply measurement concepts in practical applications.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Knowledge)	1.M.1.1. Students are able to tell time to the half-hour using digital and analog clocks and order a sequence of events with respect to time.
(Application)	1.M.1.2. Find a date on the calendar.
(Application)	<p>1.M.1.3. Students are able to use different combinations of pennies, nickels, and dimes to represent money amounts to 25 cents.</p> <p>Example: Show different ways to show 15 cents using pennies, nickels, and dimes.</p> <ul style="list-style-type: none"> State the value of pennies, nickels, and dimes using money models and pictures.
(Comprehension)	<p>1.M.1.4. Students are able to estimate weight using non-standard units of measure.</p> <p>Example: The cookie weighs about _____ unifix cubes.</p>
(Knowledge)	1.M.1.5. Students are able to identify appropriate measuring tools for length, weight, capacity, and temperature.
(Comprehension)	<p>1.M.1.6. Students are able to compare and order concrete objects by temperature and capacity.</p> <p>Examples: Temperature - hotter, colder Capacity - holds more, holds less</p>

**First Grade Measurement
Performance Descriptors**

Advanced	First grade students performing at the advanced level: <ul style="list-style-type: none">• count and compare collections of coins;• use clocks and calendars to solve problems;• use appropriate units and tools to solve measurement problems.
Proficient	First grade students performing at the proficient level: <ul style="list-style-type: none">• create different combinations of equal value using dimes, nickels, and pennies;• use calendars to locate dates and sequence events and tell time to the half hour;• estimate weight using non-standard units and choose appropriate measurement tools to solve problems;• compare and order concrete objects by temperature and capacity.
Basic	First grade students performing at the basic level: <ul style="list-style-type: none">• identify types of coins;• name the days of the week.

**First Grade Number Sense
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>1.N.1.1. Students are able to read, write, count, and order numerals to 50.</p> <ul style="list-style-type: none"> • Say the forward and backward number word sequences in the range 0-50. • Say the number before and after a given number in the range 0-50. • Use one-to-one correspondence. • Keep track of what's been counted. • Associate verbal names and standard numerals with whole numbers to 50. • Count objects in a given set and write the corresponding numeral. • Identify ordinal positions using an ordered set of objects, 1st through 20th. <p>✓ <i>Associate written word names with whole numbers to 50.</i></p>
(Knowledge)	<p>1.N.1.2. Students are able to use unit fraction models to create parts of a whole.</p> <ul style="list-style-type: none"> • Determine ways in which shapes can be divided into equal pieces, i.e., fractional portions of fourths, halves, and thirds.

Indicator 2: Apply number operations with real numbers and other number systems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>1.N.2.1. Students are able to solve addition and subtraction problems with numbers 0 to 20 written in horizontal and vertical formats using a variety of strategies.</p> <p>Examples:</p> <ul style="list-style-type: none"> Doubles Near-doubles One more, one less Making tens Breaking apart numbers Commutative property Using landmark numbers Mental math Relating numbers to money Estimation Inverse operations Compensation Internalized number combinations

Indicator 3: Develop conjectures, predictions, or estimations to solve problems and verify or justify the results.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>1.N.3.1. Students are able to solve addition and subtraction problems up to 20 in context.</p> <ul style="list-style-type: none"> • Represent problem situations and solve using concrete objects, pictures, or numbers. • Explain how one arrives at solutions to problems. • Select appropriate operation(s). • Estimate to determine if a given answer is reasonable.

**First Grade Number Sense
Performance Descriptors**

Advanced	First grade students performing at the advanced level: <ul style="list-style-type: none">• estimate and solve two-digit addition and subtraction problems;• read, write, count, and sequence numerals to 100;• create fractional parts of a whole.
Proficient	First grade students performing at the proficient level: <ul style="list-style-type: none">• use various strategies to solve addition and subtraction problems up to 20;• read, write, count, and sequence numerals to 50;• create fractional parts of a whole using unit fractions.
Basic	First grade students performing at the basic level: <ul style="list-style-type: none">• solve addition and subtraction problems up to 10;• read, write, count, and sequence numerals to 20;• identify fractional parts of a whole using unit fractions.

First Grade Statistics & Probability
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use statistical models to gather, analyze, and display data to draw conclusions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	1.S.1.1. Students are able to display data in simple picture graphs with units of one and bar graphs with intervals of one. Examples: modes of transportation to school, pets owned by students, articles of clothing.
(Comprehension)	1.S.1.2. Students are able to answer questions from organized data. Example: What observation can you make from this graph?

Indicator 2: Apply the concepts of probability to predict events/outcomes and solve problems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	1.S.2.1. Students are able to recognize whether the outcome of a simple event is possible or impossible. Examples: spinners, number cubes, everyday events 1) The spinner is half blue and half yellow. Can you land on green? 2) You have green and yellow cubes in a bag. Can you pull out a green cube?

**First Grade Statistics & Probability
Performance Descriptors**

Advanced	First grade students performing at the advanced level: <ul style="list-style-type: none">• determine whether an outcome is possible, impossible, or certain;• organize and display data in more than one way and answer questions from collected data.
Proficient	First grade students performing at the proficient level: <ul style="list-style-type: none">• determine whether an outcome is possible or impossible;• organize and display data, and answer questions from collected data.
Basic	First grade students performing at the basic level: <ul style="list-style-type: none">• answer questions about data displayed in graphs.

**Second Grade Algebra
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Use procedures to transform algebraic expressions.

Note: Second grade students do not master standards for Indicator 1. Mastery of this indicator emerges and increases from grade 3 upward.

Indicator 2: Use a variety of algebraic concepts and methods to solve equations and inequalities.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>2.A.2.1. Students are able to use concepts of equal to, greater than, and less than to compare numbers (0-100).</p> <ul style="list-style-type: none"> For numbers 0 - 100, identify 10 more/10 less. Write the words less than or greater than between two numbers. Example: 50 is less than 78 Identify the number that is greater than/less than.
(Application)	<p>2.A.2.2. Students are able to solve open addition and subtraction sentences with one unknown (\square) using numbers equal to or less than 20.</p> <p>Examples:</p> $10 = \square + 8$ $\square + 6 = 8 + 1$ $\square = 7 - 3$ $10 - \square = 4$
(Application)	<p>2.A.2.3. Students are able to balance simple addition and subtraction equations using sums up to 20.</p> <p>Examples:</p> $9 + 6 = 10 + \square$ <ul style="list-style-type: none"> Use a pan balance and cubes to visually balance equations. Describe strategies used in adding and subtracting. Example: Part-part-whole Use the commutative property to solve related equations.

Indicator 3: Interpret and develop mathematical models.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>2.A.3.1. Students are able to write and solve number sentences from word problems.</p> <p>Examples: Write number sentences that go with these story problems.</p> <p>1) Mary made 9 bracelets. She bought 4 more bracelets. How many bracelets does she have in all?</p> <p>2) Bob caught 18 fish. He ate 9 for supper. How many are left?</p>

Indicator 4: Describe and apply the properties and behaviors of relations, functions and inverses.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>2.A.4.1. Students are able to find and extend growing patterns using symbols, objects, and numbers.</p> <ul style="list-style-type: none"> Identify even and odd numbers. Recognize and extend basic number patterns using a 0-99 or 1-100 chart.
(Comprehension)	<p>2.A.4.2. Students are able to determine likenesses and differences between sets.</p> <p>Example: Use Venn diagrams</p>

**Second Grade Algebra
Performance Descriptors**

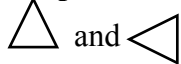
Advanced	<p>Second grade students performing at the advanced level:</p> <ul style="list-style-type: none"> create and solve addition and subtraction number sentences; compare and classify numbers and sets and explain their thinking; extend and create growing patterns.
Proficient	<p>Second grade students performing at the proficient level:</p> <ul style="list-style-type: none"> solve addition and subtraction number sentences (0-20); compare numbers and sets (1-100); find and extend growing patterns.
Basic	<p>Second grade students performing at the basic level:</p> <ul style="list-style-type: none"> solve addition and subtraction number sentences (0-10); compare sets; identify growing patterns.

**Second Grade Geometry
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Use deductive and inductive reasoning to recognize and apply properties of geometric figures.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>2.G.1.1. Students are able to use the terms side and vertex (corners) to identify plane and solid figures.</p> <p>Examples (but not limited to):</p> <p>Hexagon</p> <p>Circle</p> <p>Square</p> <p>Triangle</p> <p>Sphere</p> <p>Cube</p>

Indicator 2: Use properties of geometric figures to solve problems from a variety of perspectives.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Knowledge)	<p>2.G.2.1. Students are able to identify geometric figures regardless of position and orientation in space.</p> <p>Examples:</p> <p> are both triangles.</p>

**Second Grade Geometry
Performance Descriptors**

Advanced	<p>Second grade students performing at the advanced level:</p> <ul style="list-style-type: none"> • identify and classify plane and solid figures based on attributes; • identify and classify geometric figures regardless of position in space.
Proficient	<p>Second grade students performing at the proficient level:</p> <ul style="list-style-type: none"> • identify plane and solid figures based on attributes; • identify geometric figures regardless of position in space.
Basic	<p>Second grade students performing at the basic level:</p> <ul style="list-style-type: none"> • identify plane figures based on attributes.

Second Grade Measurement

Grade Standards, Supporting Skills, and Examples

Indicator 1: Apply measurement concepts in practical applications.

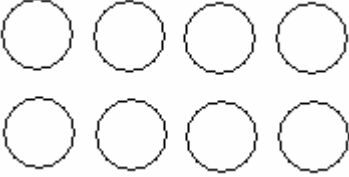
Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Knowledge)	2.M.1.1. Students are able to tell time to the minute using digital and analog clocks and relate time to daily events.
(Application)	2.M.1.2. Students are able to use the calendar to solve problems.
(Application)	2.M.1.3. Students are able to determine the value of a collection of like and unlike coins with a value up to \$1.00.
(Knowledge)	2.M.1.4. Students are able to represent and write the value of money using the “¢” sign and in decimal form using the “\$” sign.
(Comprehension)	2.M.1.5. Students are able to use whole number approximations for capacity using non-standard units of measure. Examples: The jar holds about how many marbles? How many small jars of water will it take to fill a big jar?
(Comprehension)	2.M.1.6. Students are able to solve everyday problems by measuring length to the nearest inch or foot. Examples: How long is your shoe? How tall is your chair?
(Application)	2.M.1.7. Students are able to locate and name concrete objects that are about the same length, height, weight, capacity, and temperature as a given concrete object.

**Second Grade Measurement
Performance Descriptors**

Advanced	Second grade students performing at the advanced level: <ul style="list-style-type: none">• count, compare, and trade coins appropriately for a given amount;• solve problems using time;• use appropriate units and tools in various measurement situations.
Proficient	Second grade students performing at the proficient level: <ul style="list-style-type: none">• count collections of coins up to \$1.00 and represent the value using appropriate forms;• tell time to one minute intervals and use calendars to solve problems;• measure the length of concrete objects to the nearest inch or foot;• name concrete objects of comparable dimensions.
Basic	Second grade students performing at the basic level: <ul style="list-style-type: none">• count collections of dimes, nickels, or pennies;• tell time to the half-hour;• measure concrete objects using non-standard units.

**Second Grade Number Sense
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>2.N.1.1. Students are able to read, write, count, and sequence numerals to 100.</p> <ul style="list-style-type: none"> • Say the forward and backward number word sequences in the range 0-100. • Say the number before and after a given number in the range 0-100. • Say the forward and backward skip counting sequences in the range 0-100 for twos, fives, and tens. • Use one-to-one correspondence. • Keep track of what's been counted. • Count objects by groups of twos, fives and tens to 100. • Associate verbal names, written word names, and standard numerals with whole numbers to 100. • Use words, models, and expanded notation to structure numbers as tens and ones to 100.
(Comprehension)	<p>2.N.1.2. Students are able to identify and represent fractions as parts of a group.</p> <p>Example: Circle half of the cookies.</p> 

Indicator 2: Apply number operations with real numbers and other number systems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>2.N.2.1. Students are able to solve two-digit addition and subtraction problems written in horizontal and vertical formats using a variety of strategies.</p> <p>Examples:</p> <ul style="list-style-type: none"> Doubles Near-doubles One more, one less Making tens Breaking apart numbers Commutative property Using landmark numbers Mental math Relating to money Estimation Inverse operations Compensation

Indicator 3: Develop conjectures, predictions, or estimations to solve problems and verify or justify the results.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>2.N.3.1. Students are able to solve addition and subtraction problems up to 100 in context.</p> <ul style="list-style-type: none"> • Represent problem situations and solve using concrete objects, pictures, numbers, tables, or charts. • Explain the strategies used to arrive at a solution to a problem. • Select appropriate operation(s). • Estimate to determine if a given answer is reasonable.

**Second Grade Number Sense
Performance Descriptors**

Advanced	Second grade students performing at the advanced level: <ul style="list-style-type: none"> • apply strategies of two-digit addition and subtraction to three-digit numbers; • read, write, count, and sequence numerals to 1,000; • create fractional parts of a group.
Proficient	Second grade students performing at the proficient level: <ul style="list-style-type: none"> • use various strategies to solve addition and subtraction problems using one- and two-digit numbers; • read, write, count, and sequence numerals to 100; • identify and represent fractional parts of a group.
Basic	Second grade students performing at the basic level: <ul style="list-style-type: none"> • solve addition and subtraction problems to 20; • read, write, count, and sequence numerals to 50.

Second Grade Statistics & Probability
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use statistical models to gather, analyze, and display data to draw conclusions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>2.S.1.1. Students are able to use interviews, surveys, and observations to gather data.</p> <p>Examples: Observe the sky conditions for 5 days. Conduct a survey on classmates' eye colors.</p>
(Application)	<p>2.S.1.2. Students are able to represent data sets in more than one way.</p> <p>Examples: bar graphs, frequency tables, pictographs.</p>
(Comprehension)	<p>2.S.1.3. Students are able to answer questions about and generate explanations of data given in tables and graphs.</p> <ul style="list-style-type: none"> Explore features of data sets Example: range and mode

Indicator 2: Apply the concepts of probability to predict events/outcomes and solve problems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>2.S.2.1. Students are able to list possible outcomes of a simple event and make predictions about which outcome is more or less likely to occur.</p> <p>Examples: The spinner is $\frac{1}{2}$ blue, $\frac{1}{4}$ yellow, and $\frac{1}{4}$ green. On which color are you most likely to land? You have 7 green and 3 yellow cubes in a bag. Which color cube would you be least likely to pull out?</p>

**Second Grade Statistics & Probability
Performance Descriptors**

Advanced	Second grade students performing at the advanced level: <ul style="list-style-type: none">• compare data using tables or graphs;• generate questions for a given table or graph;• make predictions and list possible outcomes that are more likely, less likely, or certain to occur.
Proficient	Second grade students performing at the proficient level: <ul style="list-style-type: none">• collect and represent data using tables or graphs;• answer questions and provide explanations for a given table or graph;• make predictions and list possible outcomes that are more or less likely to occur.
Basic	Second grade students performing at the basic level: <ul style="list-style-type: none">• represent data using tables or graphs.

ALGEBRA STANDARDS

K-2

Indicator 1: Use procedures to transform algebraic expressions.

Note: Kindergarten through grade 2 students do not master standards for Indicator 1. Mastery of this indicator emerges and increases from grade 3 upward.

Indicator 2: Use a variety of algebraic concepts and methods to solve equations and inequalities.

Kindergarten	First Grade	Second Grade
K.A.2.1. (Comprehension) Compare collections of objects to determine more, less, and equal (greater than and less than).	1.A.2.1. (Comprehension) Use the concepts and language of more, less, and equal (greater than and less than) to compare numbers and sets (0 to 20).	2.A.2.1. (Comprehension) Use concepts of equal to, greater than, and less than to compare numbers (0-100).
	1.A.2.2. (Application) Solve open addition and subtraction sentences with one unknown (\square) using numbers equal to or less than 10.	2.A.2.2. (Application) Solve open addition and subtraction sentences with one unknown (\square) using numbers equal to or less than 20.
		2.A.2.3. (Application) Balance simple addition and subtraction equations using sums up to 20.

Indicator 3: Interpret and develop mathematical models.

Kindergarten	First Grade	Second Grade
K.A.3.1. (Knowledge) Use concrete objects to model the meaning of the “+” and “-” symbols.	1.A.3.1. (Application) Students are able to write number sentences from problem situations using + or – and = with numbers to 10.	2.A.3.1. (Application) Write and solve number sentences from word problems.

Indicator 4: Describe and apply the properties and behaviors of relations, functions and inverses.

Kindergarten	First Grade	Second Grade
K.A.4.1. (Knowledge) Identify and extend two-part repeating patterns using concrete objects.	1.A.4.1. (Comprehension) Identify and extend repeating patterns containing multiple elements using objects and pictures.	2.A.4.1. (Comprehension) Find and extend growing patterns using symbols, objects, and numbers.
K.A.4.2. (Comprehension) Sort and classify objects according to one attribute.	1.A.4.2. (Comprehension) Determine common attributes in a given group and identify those objects that do not belong.	2.A.4.2. (Comprehension) Determine likenesses and differences between sets.

GEOMETRY STANDARDS

K - 2

Indicator 1: Use deductive and inductive reasoning to recognize and apply properties of geometric figures.

Kindergarten	First Grade	Second Grade
K.G.1.1. (Knowledge) Identify basic two-dimensional (plane) figures.	1.G.1.1. (Comprehension) Describe characteristics of plane figures.	2.G.1.1. (Comprehension) Use the terms side and vertex (corners) to identify plane and solid figures.
	1.G.1.2. (Comprehension) Sort basic three-dimensional figures.	

Indicator 2: Use properties of geometric figures to solve problems from a variety of perspectives.

Kindergarten	First Grade	Second Grade
K.G.2.1. (Comprehension) Describe the position of two-dimensional (plane) figures.	1.G.2.1. (Comprehension) Describe proximity of objects in space.	2.G.2.1. (Knowledge) Identify geometric figures regardless of position and orientation in space.

MEASUREMENT STANDARDS K-2

Indicator 1: Apply measurement concepts in practical applications.

Kindergarten	First Grade	Second Grade
K.M.1.1. (Knowledge) Tell time to the hour using analog and digital clocks.	1.M.1.1. (Knowledge) Tell time to the half-hour using analog and digital clocks and order a sequence of events with respect to time.	2.M.1.1. (Knowledge) Tell time to the minute using analog and digital clocks and relate time to daily events.
K.M.1.2. (Knowledge) Name the days of the week.	1.M.1.2. (Application) Find a date on the calendar.	2.M.1.2. (Application) Use the calendar to solve problems.
K.M.1.3. (Knowledge) Identify pennies, nickels, dimes, and quarters using money models.	1.M.1.3. (Application) Use different combinations of pennies, nickels, and dimes to represent money amounts to 25 cents.	2.M.1.3. (Application) Determine the value of a collection of like and unlike coins with a value up to \$1.00.
K.M.1.4. (Knowledge) Estimate length using non-standard units of measure.	1.M.1.4. (Comprehension) Estimate weight using non-standard units of measure.	2.M.1.4. (Knowledge) Represent and write the value of money using the “¢” sign and in decimal form using the “\$” sign.
K.M.1.5. (Comprehension) Compare and order concrete objects by length, height, and weight.	1.M.1.5. (Knowledge) Identify appropriate measuring tools for length, weight, capacity, and temperature.	2.M.1.5. (Comprehension) Use whole number approximations for capacity using non-standard units of measure.
	1.M.1.6. (Comprehension) Compare and order concrete objects by temperature and capacity.	2.M.1.6. (Comprehension) Solve everyday problems by measuring length to the nearest inch or foot.
		2.M.1.7. (Application) Locate and name concrete objects that are about the same length, height, weight, capacity, and temperature as a given concrete object.

NUMBER SENSE STANDARDS K-2

Indicator 1: Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers.

Kindergarten	First Grade	Second Grade
K.N.1.1. (Comprehension) Read, write, count, and sequence numerals to 20.	1.N.1.1. (Comprehension) Read, write, count, and order numerals to 50.	2.N.1.1. (Comprehension) Read, write, count, and sequence numerals to 100.
K.N.1.2. (Knowledge) Use fraction models to create one half of a whole.	1.N.1.2. (Knowledge) Use unit fraction models to create parts of a whole.	2.N.1.2. (Comprehension) Identify and represent fractions as parts of a group.

Indicator 2: Apply number operations with real numbers and other number systems.

Kindergarten	First Grade	Second Grade
	1.N.2.1. (Application) Solve addition and subtraction problems with numbers 0 to 20 written in horizontal and vertical formats using a variety of strategies.	2.N.2.1. (Application) Solve two-digit addition and subtraction problems written in horizontal and vertical formats using a variety of strategies.

Indicator 3: Develop conjectures, predictions, or estimations to solve problems and verify or justify the results.

Kindergarten	First Grade	Second Grade
K.N.3.1. (Application) Solve addition and subtraction problems up to 10 in context.	1.N.3.1. (Application) Solve addition and subtraction problems up to 20 in context.	2.N.3.1. (Application) Solve addition and subtraction problems up to 100 in context.

STATISTICS AND PROBABILITY STANDARDS K-2

Indicator 1: Use statistical models to gather, analyze, and display data to draw conclusions.

Kindergarten	First Grade	Second Grade
K.S.1.1. (Knowledge) Describe data represented in simple graphs (using real objects) and pictographs.	1.S.1.1. (Application) Display data in simple picture graphs with units of one and bar graphs with intervals of one.	2.S.1.1. (Comprehension) Use interviews, surveys, and observations to gather data.
	1.S.1.2. (Comprehension) Answer questions from organized data.	2.S.1.2. (Application) Represent data sets in more than one way.
		2.S.1.3. (Comprehension) Answer questions about and generate explanations of data given in tables and graphs.

Indicator 2: Apply the concepts of probability to predict events/outcomes and solve problems.

Kindergarten	First Grade	Second Grade
(Mastery of this indicator does not emerge until first grade.)	1.S.2.1. (Comprehension) Recognize whether the outcome of a simple event is possible or impossible.	2.S.2.1. (Application) List possible outcomes of a simple event and make predictions about which outcome is more or less likely to occur.

Third Grade Algebra
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use procedures to transform algebraic expressions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	3.A.1.1. Students are able to explain the relationship between repeated addition and multiplication. Example: Complete the number sentence. $4 + 4 + 4 = \square \times 4$
(Knowledge)	3.A.1.2. Students are able to identify special properties of 0 and 1 with respect to arithmetic operations (addition, subtraction, multiplication). Examples: $2 + 0 = 2$ $2 - 0 = 2$ $2 \times 0 = 0$ $2 \times 1 = 2$

Indicator 2: Use a variety of algebraic concepts and methods to solve equations and inequalities.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	3.A.2.1. Students are able to select appropriate relational symbols (<, >, =) to compare numbers. Examples: Use <, >, or = symbols to compare the numbers. 1) $16 \square 12$ 2) $92 \square 129$
(Application)	3.A.2.2. Students are able to solve problems involving addition and subtraction of whole numbers. <ul style="list-style-type: none"> • Use concrete materials to model and solve equations (hands-on). • Represent given problem situations using diagrams, models, and symbolic expressions.

Indicator 3: Interpret and develop mathematical models.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	3.A.3.1. Students are able to use the relationship between multiplication and division to compute and check results. Example: $3 \times 7 = 21$, so $21 \div 7 = 3$.

Indicator 4: Describe and use the properties and behaviors of relations, functions, and inverses.

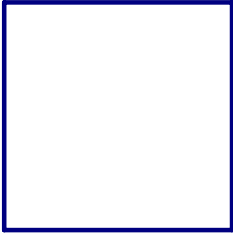
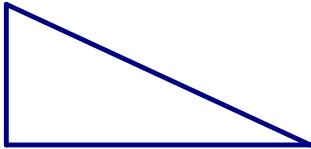

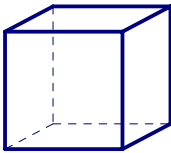
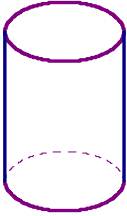
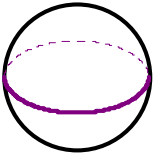
Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	3.A.4.1. Students are able to extend linear patterns. Example: 4, 8, 12, __, __....
(Application)	3.A.4.2. Students are able to use number patterns and relationships to learn basic facts. Example: nines tables

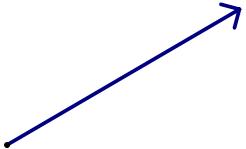
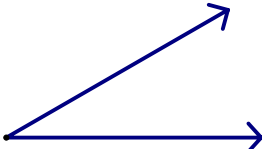
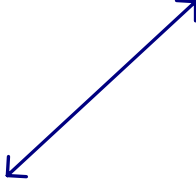
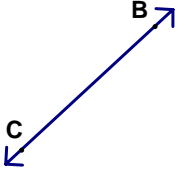
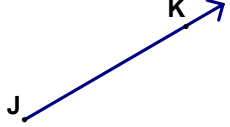

**Third Grade Algebra
Performance Descriptors**

Advanced	Third grade students performing at the advanced level: <ul style="list-style-type: none"> • create and solve equations involving addition, subtraction, and multiplication of whole numbers; • create linear patterns.
Proficient	Third grade students performing at the proficient level: <ul style="list-style-type: none"> • demonstrate linear patterns and number patterns; • identify special properties of zero and one; • using whole numbers solve equations involving addition and subtraction; • explain the relationship between repeated addition and multiplication and multiplication and division; • select appropriate symbols to compare numbers.
Basic	Third grade students performing at the basic level: <ul style="list-style-type: none"> • identify the property of zero in addition; • simplify whole number expressions in addition and subtraction; • using whole numbers, solve number sentences.

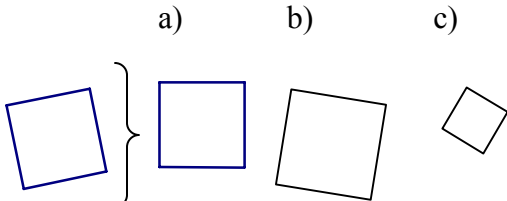
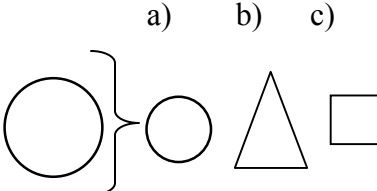
Third Grade Geometry Grade Standards, Supporting Skills, and Examples

Indicator 1: Use deductive and inductive reasoning to recognize and apply properties of geometric figures.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>3.G.1.1. Students are able to recognize and compare the following plane and solid geometric figures: square, rectangle, triangle, cube, sphere, and cylinder.</p> <p>Example: Name each plane figure. Tell the number of sides and the number of corners each figure has.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>1)</p>  </div> <div style="text-align: center;"> <p>2)</p>  </div> </div> <div style="text-align: center; margin-top: 20px;"> <p>3)</p>  </div> <p>Example: Name each solid figure.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>1)</p>  </div> <div style="text-align: center;"> <p>2)</p>  </div> <div style="text-align: center;"> <p>3)</p>  </div> </div>

<p>(Knowledge)</p>	<p>3.G.1.2. Students are able to identify points, lines, line segments, and rays.</p> <p>Example: Which of the following drawings represents a line?</p> <p>(a) </p> <p>(b) </p> <p>(c) </p> <p>Example: Name each figure.</p> <p>1) </p> <p>a) line CB b) line segment BC c) ray CB d) ray BC</p> <p>2) </p> <p>a) line JK b) line segment KJ c) ray JK d) ray KJ</p> <p>3) </p> <p>a) line LM b) line segment ML c) ray LM d) ray ML</p>
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Indicator 2: Use properties of geometric figures to solve problems from a variety of perspectives.


Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>3.G.2.1. Students are able to demonstrate relationships between figures using similarity and congruence.</p> <p>Example: Congruent plane figures</p> <p>Which figure (a, b, or c) is congruent to the first figure?</p> <div style="text-align: center;">  </div> <p>Example: Similar plane figures</p> <p>Which figure (a or b) is similar to the first figure?</p> <div style="text-align: center;">  </div> <p>√ Identify a line of symmetry in circles, squares, and rectangles.</p>

**Third Grade Geometry
Performance Descriptors**

Advanced	Third grade students performing at the advanced level: <ul style="list-style-type: none">• sketch two-dimensional figures from given properties of the figure;• determine similarity and congruence of a variety of two-dimensional figures;• determine line of symmetry in circles, squares, and rectangles.
Proficient	Third grade students performing at the proficient level: <ul style="list-style-type: none">• identify properties of two- and three-dimensional figures;• demonstrate similarity and congruence of simple two-dimensional figures;• identify points, lines, line segments, and rays.
Basic	Third grade students performing at the basic level: <ul style="list-style-type: none">• identify properties of two-dimensional figures;• identify points and line segments.

**Third Grade Measurement
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Apply measurement concepts in practical applications.


Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Knowledge)	3.M.1.1. Students are able to read and tell time before and after the hour within five-minute intervals on an analog clock.
(Application)	3.M.1.2. Students are able to count, compare, and solve problems using a collection of coins and bills.
(Knowledge)	3.M.1.3. Students are able to identify U.S. Customary units of length (feet), weight (pounds), and capacity (gallons).
(Application)	3.M.1.4. Students are able to select appropriate units to measure length (inch, foot, mile, yard); weight (ounces, pounds, tons); and capacity (cups, pints, quarts, gallons). Example: Choose the more reasonable measurement for a car. a) 1 ton b) 1 pound
(Knowledge)	3.M.1.5. Students are able to measure length to the nearest $\frac{1}{2}$ inch. Example: Measure this line segment to the nearest $\frac{1}{2}$ inch.  √ Measure length to the nearest centimeter.

**Third Grade Measurement
Performance Descriptors**

Advanced	Third grade students performing at the advanced level: <ul style="list-style-type: none"> • convert and compare time in minute units of measure; • convert and compare U.S. Customary units of measure.
Proficient	Third grade students performing at the proficient level: <ul style="list-style-type: none"> • identify time before and after the hour within 5 minute intervals; • select the appropriate units for measurement; • solve money problems; • measure length in U.S. Customary; • identify U.S. Customary units of length, capacity, weight, and temperature.
Basic	Third grade students performing at the basic level: <ul style="list-style-type: none"> • identify units of time in $\frac{1}{2}$ hour units; • identify U.S. Customary units of measure of length, capacity, weight, and temperature; • count money.

Third Grade Number Sense
Grade Standards, Supporting Skills, and Examples

Indicator 1: Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>3.N.1.1. Students are able to place in order and compare whole numbers less than 10,000, using appropriate words and symbols.</p> <p>Example: Use appropriate symbols ($<$, $>$, $=$) to compare the numbers.</p> <p style="text-align: center;">1,032 \square 923</p>
(Comprehension)	<p>3.N.1.2. Students are able to find multiples of whole numbers 2, 5, and 10.</p>
(Knowledge)	<p>3.N.1.3. Students are able to name and write fractions from visual representations.</p> <p>Example: What fraction is represented by the shaded portion?</p> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> • Recognize that fractions and decimals are parts of a whole. ✓ <i>Compare numerical value of fractions having like denominators.</i> ✓ <i>Compare decimals expressed as tenths and hundredths.</i>

Indicator 2: Apply operations within the set of real numbers.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>3.N.2.1. Students are able to add and subtract whole numbers up to three digits and multiply two digits by one digit.</p> <ul style="list-style-type: none"> • Recall multiplication facts through the tens. <p style="padding-left: 40px;">Example: fact families.</p>

Indicator 3: Develop conjectures, predictions, or estimations in the process of problem solving and verify or justify the results.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	3.N.3.1. Students are able to round two-digit whole numbers to the nearest tens, and three-digit whole numbers to the nearest hundreds.

**Third Grade Number Sense
Performance Descriptors**


Advanced	Third grade students performing at the advanced level: <ul style="list-style-type: none"> • create visual representation of fractions; • solve problems using multiplication, addition, and subtraction; • convert fractions to decimals; • use estimation to solve problems.
Proficient	Third grade students performing at the proficient level: <ul style="list-style-type: none"> • order and compare whole numbers less than ten thousand; • find multiples for numbers 2 through 10; • name and write fractions from visual representation; • add and subtract whole numbers up to three digits; • know multiplication facts through the tens and multiply two digits by one digit; • round whole numbers to the nearest ten and hundred.
Basic	Third grade students performing at the basic level: <ul style="list-style-type: none"> • order and compare whole numbers less than one thousand; • find multiples of two, five and ten; • identify fractions from visual representation; • add and subtract whole numbers up to three digits without regrouping; • know multiplication facts (0, 1, 2, 5, 10).

Third Grade Statistics & Probability
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use statistical models to gather, analyze, and display data to draw conclusions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	3.S.1.1. Students are able to ask and answer questions from data represented in bar graphs, pictographs and tally charts.
(Application)	3.S.1.2. Students are able to gather data and use the information to complete a scaled and labeled graph.

Indicator 2: Apply the concepts of probability to predict outcomes and solve problems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	3.S.2.1. Students are able to describe events as certain or impossible. Example: What is the possibility you will spin and land on green? 

Third Grade Statistics & Probability
Performance Descriptors

Advanced	Third grade students performing at the advanced level: <ul style="list-style-type: none"> • create a graph from gathered data; • create a list of events that are certain or impossible.
Proficient	Third grade students performing at the proficient level: <ul style="list-style-type: none"> • answer questions from data represented in graphs; • describe events that are certain or impossible; • complete a given graph.
Basic	Third grade students performing at the basic level: <ul style="list-style-type: none"> • answer simple questions about a graph; • identify events that are impossible.

Fourth Grade Algebra
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use procedures to transform algebraic expressions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	4.A.1.1. Students are able to simplify whole number expressions involving addition, subtraction, multiplication, and division. Examples: Simplify $3(2 \times 5)$
(Application)	4.A.1.2. Students are able to recognize and use the commutative property of addition and multiplication. Example: What property is 3×4 ? <ul style="list-style-type: none"> • Use models to identify commutative property. Example: area models (3×5 and 5×3)
(Application)	4.A.1.3. Students are able to relate the concepts of addition, subtraction, multiplication, and division to one another. Examples: Solve for n . <ol style="list-style-type: none"> 1) $6 + n = 10$ 2) $10 - n = 6$ 3) $2 \times n = 12$ 4) $12 \div n = 2$

Indicator 2: Use a variety of algebraic concepts and methods to solve equations and inequalities.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	4.A.2.1. Students are able to select appropriate relational symbols ($<$, $>$, $=$) to make number sentences true. Example: Complete the number sentence. $15 + 23 \square 82 - 38$
(Application)	4.A.2.2. Students are able to simplify a two-step equation using whole numbers. Example: Solve for n . $6 + n = 15 + 8$

Indicator 3: Interpret and develop mathematical models.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>4.A.3.1. Students are able to write and solve number sentences that represent one-step word problems using whole numbers.</p> <p>Example: Bike Safety booklets are free at the Community Day Fair. Twenty-one booklets have been put into three equal groups. How many booklets are in each group?</p> <ul style="list-style-type: none"> Use multiple methods, such as physical models, tables and charts, the number line, and graphs.

Indicator 4: Describe and use the properties and behaviors of relations, functions and inverses.

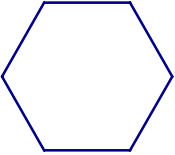
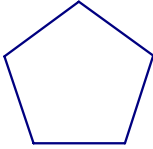
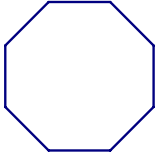
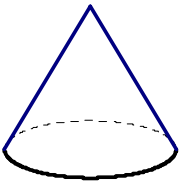
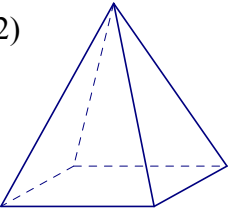

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples														
(Application)	<p>4.A.4.1. Students are able to solve problems involving pattern identification and completion of patterns.</p> <p>Example: Complete the table.</p> <table border="1"> <thead> <tr> <th>Input</th><th>Output</th></tr> </thead> <tbody> <tr> <td>2</td><td>4</td></tr> <tr> <td>6</td><td>8</td></tr> <tr> <td>8</td><td></td></tr> </tbody> </table> <p>Example: What are the next two numbers in the sequence? Sequence: 1, 3, 7, 13, <input type="text"/>, <input type="text"/></p> <p>✓ <i>Describe a rule for given patterns.</i></p> <p><i>Examples:</i></p> <p>1) <i>Describe the rule for the table below.</i></p> <table border="1"> <thead> <tr> <th><i>Input</i></th><th><i>Output</i></th></tr> </thead> <tbody> <tr> <td>2</td><td>4</td></tr> <tr> <td>6</td><td>8</td></tr> </tbody> </table> <p>2) <i>Describe the rule for the sequence below.</i></p> <p>Sequence: 1, 3, 7, 13, <input type="text"/>, <input type="text"/></p>	Input	Output	2	4	6	8	8		<i>Input</i>	<i>Output</i>	2	4	6	8
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<i>Input</i>	<i>Output</i>														
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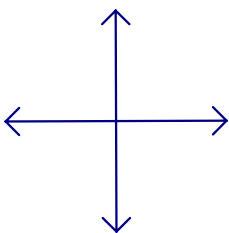
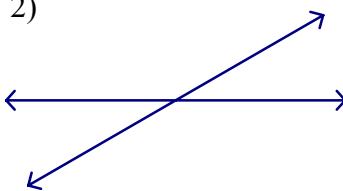
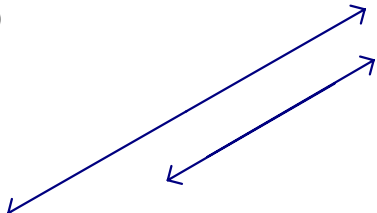
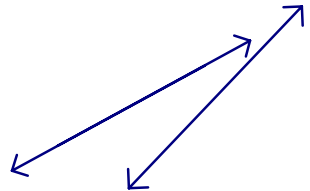
**Fourth Grade Algebra
Performance Descriptors**

Advanced	Fourth grade students performing at the advanced level: <ul style="list-style-type: none"> • solve algebraic equations using inverse operations and order of operations with addition and subtraction using whole numbers; • solve word problems by converting them to algebraic statements; • create patterns to solve problems and justify their solution.
Proficient	Fourth grade students performing at the proficient level: <ul style="list-style-type: none"> • use the commutative property of addition and multiplication; • identify and complete patterns and describe the associated rule; • write and solve number sentences using whole numbers; • simplify a two-step equation using whole numbers; • show relationships between all operations; • simplify whole number expressions in all operations; • select appropriate relational symbols to make number sentences true.
Basic	Fourth grade student performing at the basic level: <ul style="list-style-type: none"> • show relationship between addition and subtraction; • simplify whole number expressions in addition and subtraction; • using whole numbers, solve number sentences.

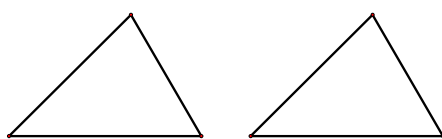
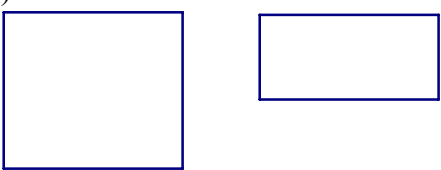
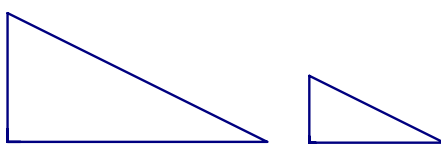
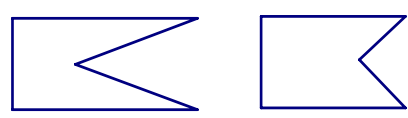
Fourth Grade Geometry
Grade Standards, Supporting Skills, and Examples

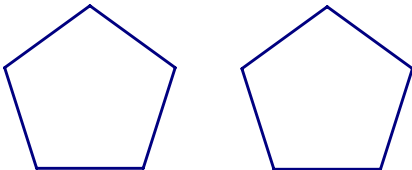
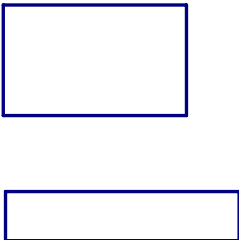
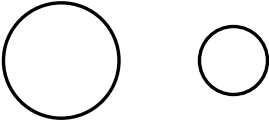
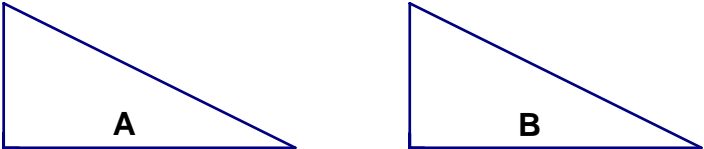
Indicator 1: Use deductive and inductive reasoning to recognize and apply properties of geometric figures.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Knowledge)	<p>4.G.1.1. Students are able to identify the following plane and solid figures: pentagon, hexagon, octagon, pyramid, rectangular prism, and cone.</p> <p>Example: Identify each polygon.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>1)</p>  </div> <div style="text-align: center;"> <p>2)</p>  </div> <div style="text-align: center;"> <p>3)</p>  </div> </div> <p>Example: Identify each solid figure.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>1)</p>  </div> <div style="text-align: center;"> <p>2)</p>  </div> <div style="text-align: center;"> <p>3)</p>  </div> </div>

(Knowledge)	<p>4.G.1.2. Students are able to identify parallel, perpendicular, and intersecting lines.</p> <p>Example: Identify the following lines as parallel, perpendicular, or neither.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>1)</p>  </div> <div style="text-align: center;"> <p>2)</p>  </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;"> <p>3)</p>  </div> <div style="text-align: center;"> <p>4)</p>  </div> </div>
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Indicator 2: Use properties of geometric figures to solve problems from a variety of perspectives.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>4.G.2.1. Students are able to compare geometric figures using size, shape, orientation, congruence, and similarity.</p> <p>Example: Which pair is congruent?</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>(a)</p>  </div> <div style="text-align: center;"> <p>(b)</p>  </div> </div> <p>Example: Which pair is similar?</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>(a)</p>  </div> <div style="text-align: center;"> <p>(b)</p>  </div> </div>

	<p>Example: Label the following figures as similar or congruent.</p> <p>1)</p>  <p>2)</p>  <p>3)</p>  <p>✓ Identify lines of symmetry in rectangles, squares, and triangles.</p>
(Knowledge)	<p>4.G.2.2. Students are able to identify a slide (translation) of a given figure.</p> <p>Example: Tell how the triangle was moved from Position A to Position B.</p>  <p>✓ Identify Flips and Turns</p>

**Fourth Grade Geometry
Performance Descriptors**

Advanced	<p>Fourth grade students performing at the advanced level:</p> <ul style="list-style-type: none"> • sketch two- and three-dimensional figures and identify the lines and angles; • illustrate flip, turn, or slide (reflection, rotation, or translation).
Proficient	<p>Fourth grade students performing at the proficient level:</p> <ul style="list-style-type: none"> • identify and compare two- and three-dimensional figures, lines, and angles; • identify slide (translation).
Basic	<p>Fourth grade students performing at the basic level:</p> <ul style="list-style-type: none"> • recognize basic geometric figures; • demonstrate a slide (translation) using concrete objects.

Fourth Grade Measurement
Grade Standards, Supporting Skills, and Examples

Indicator 1: Apply measurement concepts in practical applications.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Knowledge)	<p>4.M.1.1. Students are able to identify equivalent periods of time and solve problems.</p> <p>Example: Identify relationships among days, months, and years; hours and minutes; a.m. and p.m.</p> <ol style="list-style-type: none"> 1) How many days are there in a year? 2) How many minutes are there in an hour? 3) How many months are there in three years? <ul style="list-style-type: none"> • Measure time using fractions to $\frac{1}{4}$. <p>Example: Identify fractions of an hour and fractions of a year.</p> <ol style="list-style-type: none"> 1) How many months equal a $\frac{1}{4}$ of a year? 2) How many minutes equal $\frac{1}{4}$ of an hour? 3) It is a quarter to four. Write the time in digital form.
(Application)	<p>4.M.1.2. Students are able to solve problems involving money including unit conversion.</p> <ul style="list-style-type: none"> • Use of proper notation. <p>Example: Roberta had six quarters, three dimes, and fourteen pennies. How much money did she have in all?</p> <p>√ <i>Determine total costs as a function of the number of units and the per unit cost.</i></p> <p><i>Example: What is the total cost of 3 pencils that cost 5 cents each?</i></p>

(Application)	<p>4.M.1.3. Students are able to use scales of length, temperature, capacity, and weight.</p> <ul style="list-style-type: none"> • Select and use the most appropriate U.S. Customary units for given measurement situations. <p>Examples:</p> <p>Use a ruler to find the length of the line segment below to the nearest quarter inch.</p> <p style="text-align: center;">_____</p>
(Comprehension)	<p>4.M.1.4. Students are able to measure length to the nearest quarter inch.</p> <ul style="list-style-type: none"> • Estimate length to the nearest inch. <p>✓ <i>Measure to the nearest centimeter.</i></p>

**Fourth Grade Measurement
Performance Descriptors**

Advanced	Fourth grade students performing at the advanced level: <ul style="list-style-type: none">• choose appropriate units and tools to solve measurement problems;• determine equivalent units of time;• solve problems involving time.
Proficient	Fourth grade students performing at the proficient level: <ul style="list-style-type: none">• measure temperature, capacity, length, and weight;• solve problems involving money;• identify equivalent periods of time.
Basic	Fourth grade students performing at the basic level: <ul style="list-style-type: none">• measure length and weight in whole units.

**Fourth Grade Number Sense
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	4.N.1.1. Students are able to read, write, order, and compare numbers from .01 to 1,000,000. <ul style="list-style-type: none"> • Read and write word names and the appropriate symbols in mathematical sentences. • Use expanded form notation.
(Comprehension)	4.N.1.2. Students are able to find multiples of whole numbers through 12. <i>√ Factors of the numbers (1-24).</i>
(Comprehension)	4.N.1.3. Students are able to use a number line to compare numerical value of fractions or mixed numbers (fourths, halves, and thirds). <ul style="list-style-type: none"> • Identify improper fractions, proper fractions, and mixed numbers. <i>√ Demonstrate that a mixed number is a whole number plus a fraction.</i>
(Application)	4.N.1.4. Students are able to interpret negative integers in temperature.

Indicator 2: Apply operations within the set of real numbers.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	4.N.2.1. Students are able to find the products of two-digit factors and quotient of two natural numbers using a one-digit divisor. <ul style="list-style-type: none"> • Recall and apply multiplication and division facts through the 12s.
(Application)	4.N.2.2. Students are able to add and subtract decimals with the same number of decimal places.

Indicator 3: Develop conjectures, predictions, or estimations in the process of problem solving and verify or justify the results.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	4.N.3.1. Students are able to estimate sums and differences in whole numbers and money to determine if a given answer is reasonable.

**Fourth Grade Number Sense
Performance Descriptors**


Advanced	Fourth grade students performing at the advanced level: <ul style="list-style-type: none"> • solve problems using multiples and factors; • compare mixed numbers, proper and improper fractions; • solve problems using fractions and decimals.
Proficient	Fourth grade students performing at the proficient level: <ul style="list-style-type: none"> • add and subtract decimals with the same number of decimal places.
Basic	Fourth grade students performing at the basic level: <ul style="list-style-type: none"> • find multiples of numbers 2 - 10; • read, write, order, and compare numbers 1 through 1,000; • compare proper fractions on a number line; • add and subtract decimals with the same number of decimal places; • find the products of two-digit numbers multiplied by one-digit; • round two-digit numbers.

Fourth Grade Statistics & Probability
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use statistical models to gather, analyze and display data to draw conclusions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	4.S.1.1. Students are able to interpret data from graphical representations and draw conclusions. Examples: bar graph, line graph, pictograph, line plot.
(Knowledge)	4.S.1.2. Given a small ordered data set of whole number data points (odd number of points), students are able to identify the median, mode, and range. Example: Given the following data set, determine the median, mode, and range. 1, 1, 2, 3, 5

Indicator 2: Apply the concepts of probability to predict outcomes and solve problems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	4.S.2.1. Students are able to determine the probability of simple events limited to equally likely and not equally likely outcomes. Example: Is it equally likely or not equally likely the spinner will land on black? 

**Fourth Grade Statistics & Probability
Performance Descriptors**

Advanced	Fourth grade students performing at the advanced level: <ul style="list-style-type: none">• collect data and create a graphical representation;• identify and use median, mode, and range to solve problems;• determine probability of events.
Proficient	Fourth grade students performing at the proficient level: <ul style="list-style-type: none">• interpret data from graphical representations;• identify median, mode, and range;• determine outcome of events as equally likely and not equally likely.
Basic	Fourth grade students performing at the basic level: <ul style="list-style-type: none">• answer questions from graphs;• identify mode;• recognize the likelihood of outcomes in simple events.

Fifth Grade Algebra
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use procedures to transform algebraic expressions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	5.A.1.1. Students are able to use a variable to write an addition expression. Example: Mary has two more marbles than Tom. Write an expression to represent the number of marbles that Mary has.
(Application)	5.A.1.2. Students are able to recognize and use the associative property of addition and multiplication. Example: $(3 \times 2) \times 6 = 3 \times (2 \times 6)$

Indicator 2: Use a variety of algebraic concepts and methods to solve equations and inequalities.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	5.A.2.1. Students are able to write one-step first degree equations using the set of whole numbers and find a solution. Example: Doris has 10 marbles which is twice the number John has. How many marbles does John have? <i>✓ Use the understanding that an equality relationship between two quantities remains the same as long as the same change is made to both quantities.</i>

Indicator 3: Interpret and develop mathematical models.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	5.A.3.1. Students are able to, using whole numbers, write and solve number sentences that represent two-step word problems. Example: Don can spend one hour researching in the library to write a paper. He spends 25 minutes gathering books and then 31 minutes writing notes. How much time does he have left?

(Application)	<p>5.A.3.2. Students are able to identify information and apply it to a given formula.</p> <p>Examples:</p> <ol style="list-style-type: none"> 1) Given the formula for area, $A = lw$, what is the area of a rectangle 3cm by 5cm? 2) Given the formula for distance, $D = rt$, the troop hiked 12 miles in 4 hours. At what rate did they hike?
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Indicator 4: Describe and use the properties and behaviors of relations, functions, and inverses.

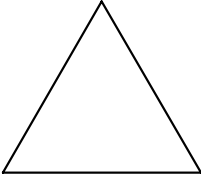
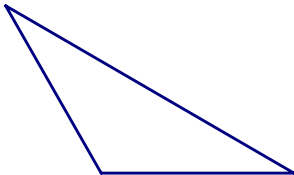
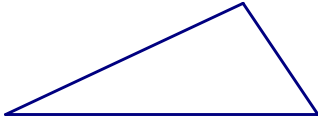
Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>5.A.4.1. Students are able to solve problems using patterns involving more than one operation.</p> <p>Example: What are the next two numbers of the sequence?</p> <p>Sequence: 1, 4, 2, 5, 3, □, □</p> <p>Rule: +3, -2</p>

**Fifth Grade Algebra
Performance Descriptors**

Advanced	<p>Fifth grade students performing at the advanced level:</p> <ul style="list-style-type: none"> • justify solutions to algebraic equations using the four basic operations using whole numbers; • analyze the relationship between graphic representations and numeric solutions.
Proficient	<p>Fifth grade students performing at the proficient level:</p> <ul style="list-style-type: none"> • write and solve number sentences to represent two-step problems using whole numbers; • identify information and apply it to a given formula; • recognize and use associative property with addition and multiplication; • use a variable to write addition expressions; • write and solve one-step equations; • solve problems using patterns.
Basic	<p>Fifth grade students performing at the basic level:</p> <ul style="list-style-type: none"> • solve simple one-step equations involving four basic operations using whole numbers; • recognize the associative property of addition; • use a variable to write an addition expression.

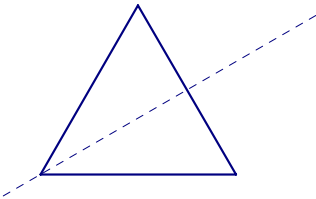
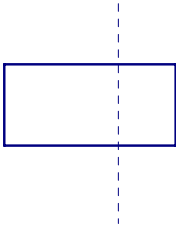
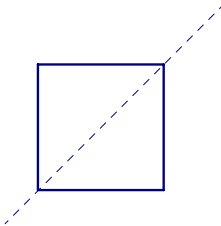
Fifth Grade Geometry
Grade Standards, Supporting Skills, and Examples

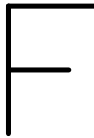
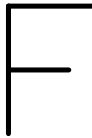
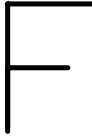
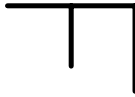
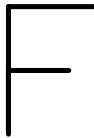
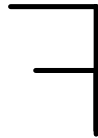
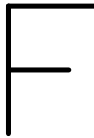
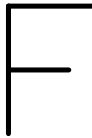
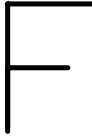
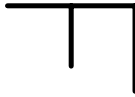
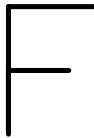
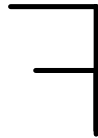
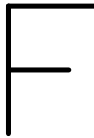
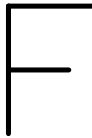
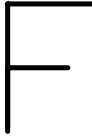
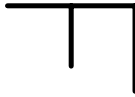
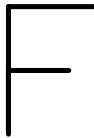
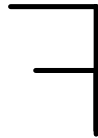
Indicator 1: Use deductive and inductive reasoning to recognize and apply properties of geometric figures.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Knowledge)	<p>5.G.1.1. Students are able to describe and identify isosceles and equilateral triangles, pyramids, rectangular prisms, and cones.</p> <p>Example: Classify each triangle as equilateral, isosceles, or scalene.</p> <p>(1) All sides are of length 5 inches.</p> <p>a) equilateral b) isosceles c) scalene</p>  <p>(2) Two sides are of length 8 inches.</p> <p>a) equilateral b) isosceles c) scalene</p>  <p>(3) One side is of length 10 inches.</p> <p>a) equilateral b) isosceles c) scalene</p> 

(Knowledge)	<p>5.G.1.2. Students are able to identify acute, obtuse, and right angles.</p> <p>Example: Classify each angle.</p> <p>1)</p> <div data-bbox="673 388 820 504"> <p>a) acute b) right c) obtuse</p> </div> <div data-bbox="1096 367 1299 577"> </div> <p>2)</p> <div data-bbox="673 619 820 735"> <p>a) acute b) right c) obtuse</p> </div> <div data-bbox="1112 598 1323 724"> </div> <p>3)</p> <div data-bbox="673 840 820 955"> <p>a) acute b) right c) obtuse</p> </div> <div data-bbox="1088 829 1469 955"> </div>
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Indicator 2: Use properties of geometric figures to solve problems from a variety of perspectives.

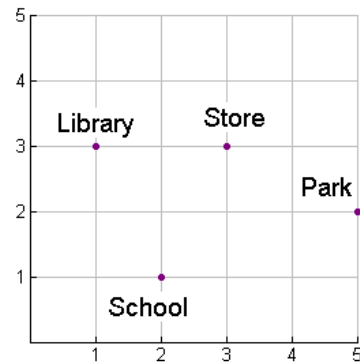
Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>5.G.2.1. Students are able to determine lines of symmetry in rectangles, squares, and triangles.</p> <p>Example: Which of the following demonstrates a line of symmetry?</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>a)</p>  </div> <div style="text-align: center;"> <p>b)</p>  </div> <div style="text-align: center;"> <p>c)</p>  </div> </div> <p>Example: How many lines of symmetry are there in:</p> <ol style="list-style-type: none"> 1) a square? 2) an equilateral triangle? 3) an isosceles triangle? 4) a rectangle that is not a square?

	<p>5.G.2.2. Students are able to identify a turn or flip (rotation or reflection) of a given figure.</p> <p>Example:</p> <p>1) Which of the following is an example of a rotation?</p> <p>2) Which of the following is an example of a reflection?</p>												
(Knowledge)	<table><tr><th></th><th>Position A</th><th>Position B</th></tr><tr><td>a)</td><td></td><td></td></tr><tr><td>b)</td><td></td><td></td></tr><tr><td>c)</td><td></td><td></td></tr></table>		Position A	Position B	a)			b)			c)		
	Position A	Position B											
a)													
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c)													

5.G.2.3. Students are able to use two-dimensional coordinate grids to find locations and represent points and simple figures.

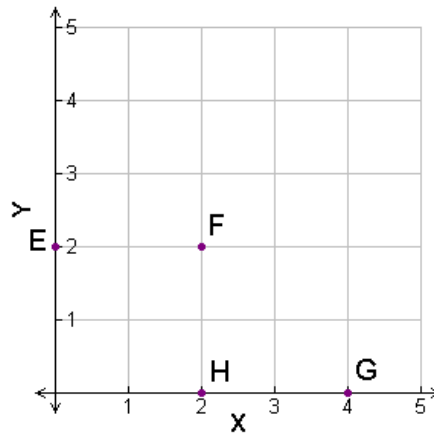
Example:

- 1) What are the coordinates of the school?
- 2) Which building is at (1,3)?



(Application)

Example: Which point best represents the ordered pair (2,2)?




**Fifth Grade Geometry
Performance Descriptors**

Advanced	Fifth grade students performing at the advanced level: <ul style="list-style-type: none">• classify quadrilaterals and triangles;• create a simple figure on a coordinate grid using ordered pairs.
Proficient	Fifth grade students performing at the proficient level: <ul style="list-style-type: none">• describe two- and three-dimensional figures;• graph ordered pairs;• identify a turn (rotation) or flip (reflection) of a given figure;• classify angles.
Basic	Fifth grade students performing at the basic level: <ul style="list-style-type: none">• identify squares, rectangles, and triangles;• locate ordered pairs from given points.

**Fifth Grade Measurement
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Apply measurement concepts in practical applications.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>5.M.1.1. Students are able to determine elapsed time within an a.m. or p.m. period on the quarter-hour.</p> <p>Example: It is late afternoon; what time will it be in 3 hours and 20 minutes?</p> 
(Application)	<p>5.M.1.2. Students are able to solve problems involving money including making change.</p> <p>Example: Sara paid \$10.00 for a tape that cost \$6.95. The sales tax was 49 cents. How much money should Sara get back in change?</p> <p>√ <i>Determine per unit cost based on number of units and the total cost.</i></p> <p><i>Example: What is the price per unit?</i> <i>10 pencils for \$0.50</i> <i>1 pencil = □</i></p>
(Application)	<p>5.M.1.3. Students are able to use and convert U.S. Customary units of length (inches, feet, yard), and weight (ounces, pounds).</p> <p>Examples:</p> <p>1) How many inches are in 3 feet?</p> <p>2) How many ounces are in two pounds?</p> <p>√ <i>Use and convert U.S. Customary units of capacity (cups, pints, quarts, gallons.)</i></p>

(Application)	<p>5.M.1.4. Students are able to use appropriate tools to measure length, weight, temperature, and area in problem solving.</p> <ul style="list-style-type: none"> Estimate length and weight. <p>Examples:</p> <ol style="list-style-type: none"> 1) Sam's temperature is 99.8 degrees F. Normal body temperature is about 98.6 degrees F. Sam's temperature is how many degrees above normal body temperature? 2) Use a ruler to measure the rectangle. What is the area of the rectangle? (The rectangle should be whole number units.)
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**Fifth Grade Measurement
Performance Descriptors**

Advanced	<p>Fifth grade students performing at the advanced level:</p> <ul style="list-style-type: none"> solve two-step problems involving measurement of length, time, temperature, weight, money, and capacity.
Proficient	<p>Fifth grade students performing at the proficient level:</p> <ul style="list-style-type: none"> use appropriate tools to solve problems involving measurement of length, time, temperature, and weight; convert U.S. Customary measurement units. solve problems involving money including making change.
Basic	<p>Fifth grade students performing at the basic level:</p> <ul style="list-style-type: none"> measure length, time, temperature, weight, and capacity. solve one-step money problems.

**Fifth Grade Number Sense
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	5.N.1.1. Students are able to read, write, order, and compare numbers from .001 to 1,000,000,000.
(Comprehension)	5.N.1.2. Students are able to find prime, composite, and factors of whole numbers from 1 to 50. <i>√ Divisibility rules</i>
(Knowledge)	5.N.1.3. Students are able to identify alternative representations of fractions and decimals involving tenths, fourths, halves, and hundredths.
(Comprehension)	5.N.1.4. Students are able to locate negative integers on a number line.
(Comprehension)	5.N.1.5. Students are able to determine the squares of numbers 1 – 12.

Indicator 2: Apply operations within the set of real numbers.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	5.N.2.1. Students are able to find the quotient of whole numbers using two-digit divisors. <ul style="list-style-type: none"> • Use the inverse relationship of multiplication and division to find a missing factor. <i>√ Determine least common multiple and greatest common factor of two or more whole numbers up to 24.</i>
(Application)	5.N.2.2. Students are able to determine equivalent fractions including simplification (lowest terms of fractions).
(Application)	5.N.2.3. Students are able to multiply and divide decimals by natural numbers (1 – 9).

Indicator 3: Develop conjectures, predictions, or estimations in the process of problem solving and verify or justify the results.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	5.N.3.1. Students are able to use different estimation strategies to solve problems involving whole numbers, decimals, and fractions to the nearest whole number. <ul style="list-style-type: none"> Solve problems using non-routine strategies.

**Fifth Grade Number Sense
Performance Descriptors**

Advanced	Fifth grade students performing at the advanced level: <ul style="list-style-type: none"> find prime, composite, and factors of numbers; use division to convert fractions to decimals; order negative integers without a number line; solve problems using division; determine least common multiple and greatest common factor of two whole numbers.
Proficient	Fifth grade students performing at the proficient level: <ul style="list-style-type: none"> find prime, composite, and factors of numbers from 1 to 50; read, write, order, and compare numbers from .001 to 1,000,000,000; convert fractions and decimals (tenths, fourths, halves and hundredths); interpret negative integers on a number line; solve problems using estimation; find quotient of whole numbers using a two-digit divisor; determine equivalent fractions; multiply and divide decimals; determine squares of numbers.
Basic	Fifth grade students performing at the basic level: <ul style="list-style-type: none"> read, write, order, and compare numbers from .01 to 100,000; know prime and composite numbers to 20; recognize unit fractions; label negative integers on a number line; find quotient of whole numbers using one-digit divisor; round whole numbers.

Fifth Grade Statistics & Probability
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use statistical models to gather, analyze, and display data to draw conclusions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	5.S.1.1. Students are able to gather, graph, and interpret data. <ul style="list-style-type: none"> • Develop survey questions and collect appropriate data. • Use appropriate scales to represent data in simple bar graphs, line graphs, pictographs, and line plots.
(Application)	5.S.1.2. Students are able to calculate and explain mean for a whole number data set. Example: Given the following data set, find the mean. 526, 540, 491

Indicator 2: Apply the concepts of probability to predict outcomes and solve problems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	5.S.2.1. Students are able to classify probability of simple events as certain, likely, unlikely, or impossible. \surd <i>Express probability as a ratio.</i>
(Application)	5.S.2.2. Students are able to use models to display possible outcomes. Examples: tree diagrams, tables, and organized lists.

**Fifth Grade Statistics & Probability
Performance Descriptors**

Advanced	Fifth grade students performing at the advanced level: <ul style="list-style-type: none">• interpret data from graphs to solve problems;• when given the mean, find the missing number in a data set;• give the probability as a ratio;• predict possible outcomes.
Proficient	Fifth grade students performing at the proficient level: <ul style="list-style-type: none">• gather, graph, and interpret data;• calculate and explain mean for a whole number data set;• classify probability as certain, likely, unlikely.
Basic	Fifth grade students performing at the basic level: <ul style="list-style-type: none">• identify data from simple graphs;• recognize probability as certain or impossible.

ALGEBRA STANDARDS

3-5

Indicator 1: Use procedures to transform algebraic expressions.

Third Grade	Fourth Grade	Fifth Grade
3.A.1.1. (Comprehension) Explain the relationship between repeated addition and multiplication.	4.A.1.1. (Comprehension) Simplify whole number expressions involving addition, subtraction, multiplication, and division.	5.A.1.1. (Application) Use a variable to write an addition expression.
3.A.1.2. (Knowledge) Identify special properties of 0 and 1 with respect to arithmetic operations (addition, subtraction, multiplication).	4.A.1.2. (Application) Recognize and use the commutative property of addition and multiplication.	5.A.1.2. (Application) Recognize and use the associative property of addition and multiplication.
	4.A.1.3. (Application) Relate the concepts of addition, subtraction, multiplication, and division to one another.	

Indicator 2: Use a variety of algebraic concepts and methods to solve equations and inequalities.

Third Grade	Fourth Grade	Fifth Grade
3.A.2.1. (Comprehension) Select appropriate relational symbols ($<$, $>$, $=$) to compare numbers.	4.A.2.1. (Comprehension) Select appropriate relational symbols ($<$, $>$, $=$) to make number sentences true.	5.A.2.1. (Application) Write one-step first degree equations using the set of whole numbers and find a solution.
3.A.2.2. (Application) Solve problems involving addition and subtraction of whole numbers.	4.A.2.2. (Application) Simplify a two-step equation using whole numbers.	

Indicator 3: Interpret and develop mathematical models.

Third Grade	Fourth Grade	Fifth Grade
3.A.3.1. (Application) Use the relationship between multiplication and division to compute and check results.	4.A.3.1. (Application) Write and solve number sentences that represent one-step word problems using whole numbers.	5.A.3.1.(Application) Write and solve number sentences that represent two-step word problems using whole numbers.
		5.A.3.2. (Application) Identify information and apply it to a given formula.

Indicator 4: Describe and use the properties and behaviors of relations, functions, and inverses.

Third Grade	Fourth Grade	Fifth Grade
3.A.4.1. (Comprehension) Extend linear patterns.	4.A.4.1. (Application) Solve problems involving pattern identification and completion of patterns.	5.A.4.1. (Application) Solve problems using patterns involving more than one operation.
3.A.4.2. (Application) Use number patterns and relationships to learn basic facts.		

GEOMETRY STANDARDS

3-5

Indicator 1: Use deductive and inductive reasoning to recognize and apply properties of geometric figures.

Third Grade	Fourth Grade	Fifth Grade
3.G.1.1. (Comprehension) Recognize and compare the following plane and solid geometric figures: square, rectangle, triangle, cube, sphere, and cylinder.	4.G.1.1. (Knowledge) Identify the following plane and solid figures: pentagon, hexagon, octagon, pyramid, rectangular prism, and cone.	5.G.1.1. (Knowledge) Describe and identify isosceles and equilateral triangles, pyramids, rectangular prisms, and cones.
3.G.1.2. (Knowledge) Identify points, lines, line segments, and rays.	4.G.1.2. (Knowledge) Identify parallel, perpendicular, and intersecting lines.	5.G.1.2. (Knowledge) Identify acute, obtuse, and right angles.

Indicator 2: Use properties of geometric figures to solve problems from a variety of perspectives.

Third Grade	Fourth Grade	Fifth Grade
3.G.2.1. (Comprehension) Demonstrate relationships between figures using similarity and congruence.	4.G.2.1. (Comprehension) Compare geometric figures using size, shape, orientation, congruence, and similarity.	5.G.2.1. (Comprehension) Determine lines of symmetry in rectangles, squares, and triangles.
	4.G.2.2. (Knowledge) Identify a slide (translation) of a given figure.	5.G.2.2. (Knowledge) Identify a turn or flip (rotation or reflection) of a given figure.
		5.G.2.3. (Application) Use two-dimensional coordinate grids to find locations and represent points and simple figures.

MEASUREMENT STANDARDS

3-5

Indicator 1: Apply measurement concepts in practical applications.

Third Grade	Fourth Grade	Fifth Grade
3.M.1.1. (Knowledge) Read and tell time on an analog clock before the hour and after the hour within five-minute intervals.	4.M.1.1. (Knowledge) Identify equivalent periods of time and solve problems.	5.M.1.1. (Comprehension) Determine elapsed time within an a.m. or p.m. period on the quarter-hour.
3.M.1.2. (Application) Count, compare, and solve problems using a collection of coins and bills.	4.M.1.2. (Application) Solve problems involving money including unit conversion.	5.M.1.2. (Application) Solve problems involving money including making change.
3.M.1.3. (Knowledge) Identify U.S. Customary units of length (feet), weight (pounds), capacity (gallons).	4.M.1.3. (Application) Use scales of length, temperature, capacity, and weight.	5.M.1.3. (Application) Use and convert U.S. Customary units of length (inches, feet, yard), and weight (ounces, pounds).
3.M.1.4. (Application) Select appropriate units to measure length (inch, foot, mile, yard); weight (ounces, pounds, tons); and capacity (cups, pints, quarts, gallons).	4.M.1.4. (Comprehension) Measure length to the nearest quarter-inch.	5.M.1.4. (Application) Use appropriate tools to measure length, weight, temperature, and area in problem solving.
3.M.1.5. (Knowledge) Measure length to the nearest $\frac{1}{2}$ inch.		

NUMBER SENSE STANDARDS

3-5

Indicator 1: Use the structural characteristics of a set of real numbers and its various subsets.

Third Grade	Fourth Grade	Fifth Grade
3.N.1.1. (Comprehension) Order and compare whole numbers less than 10,000 using appropriate words and symbols.	4.N.1.1. (Comprehension) Read, write, order, and compare numbers from .01 to 1,000,000.	5.N.1.1. (Comprehension) Read, write, order, and compare numbers from .001 to 1,000,000,000.
3.N.1.2. (Comprehension) Find multiples of whole numbers 2, 5, and 10.	4.N.1.2. (Comprehension) Find multiples of whole numbers through 12.	5.N.1.2. (Comprehension) Find prime, composite, and factors of whole numbers from 1 to 50.
3.N.1.3. (Knowledge) Name and write fractions from visual representations.	4.N.1.3. (Comprehension) Use a number line to compare numerical value of fractions or mixed numbers (fourths, halves and thirds).	5.N.1.3. (Knowledge) Identify alternative representations of fractions and decimals involving tenths, fourths, halves, and hundredths.
	4.N.1.4. (Application) Interpret negative integers in temperature.	5.N.1.4. (Comprehension) Locate negative integers on a number line.
		5.N.1.5. (Comprehension) Determine the squares of numbers 1 – 12.

Indicator 2: Apply operations within the set of real numbers.

Third Grade	Fourth Grade	Fifth Grade
3.N.2.1. (Application) Add and subtract whole numbers up to three digits and multiply two digits by one digit.	4.N.2.1. (Application) Find the products of two-digit factors and quotient of two natural numbers using a one-digit divisor.	5.N.2.1. (Application) Find the quotient of whole numbers using two-digit divisors.

	4.N.2.2. (Application) Add and subtract decimals with the same number of decimal places.	5.N.2.2. (Application) Determine equivalent fractions including simplification (lowest terms of fractions).
		5.N.2.3. (Application) Multiply and divide decimals by natural numbers (1 – 9).

Indicator 3: Develop conjectures, predictions, or estimations in the process of problem solving and verify or justify the results.

Third Grade	Fourth Grade	Fifth Grade
3.N.3.1. (Application) Round two-digit whole numbers to the nearest ten and three-digit whole numbers to the nearest hundred.	4.N.3.1. (Application) Estimate sums and differences in whole numbers and money to determine if a given answer is reasonable.	5.N.3.1. (Application) Use different estimation strategies to solve problems involving whole numbers, decimals, and fractions to the nearest whole number.

STATISTICS & PROBABILITY STANDARDS

3-5

Indicator 1: Use statistical models to gather, analyze and display data to draw conclusions.

Third Grade	Fourth Grade	Fifth Grade
3.S.1.1. (Application) Ask and answer questions from data represented in bar graphs, pictographs, and tally charts.	4.S.1.1. (Application) Interpret data from graphical representations and draw conclusions.	5.S.1.1. (Application) Gather, graph, and interpret data.
3.S.1.2. (Application) Gather data and use information to complete a scaled and labeled graph.	4.S.1.2. (Knowledge) Given a small ordered data set of whole number data points (odd number of points), students will identify the median, mode, and range.	5.S.1.2. (Application) Calculate and explain mean for a whole number data set.

Indicator 2: Apply the concepts of probability to predict outcomes and solve problems.

Third Grade	Fourth Grade	Fifth Grade
3.S.2.1. (Comprehension) Describe events as certain or impossible.	4.S.2.1. (Comprehension) Determine the probability of simple events limited to equally likely and not equally likely outcomes.	5.S.2.1. (Application) Classify probability of simple events as certain, likely, unlikely, or impossible.
		5.S.2.2. (Application) Use models to display possible outcomes.

SOUTH DAKOTA MATHEMATICS STANDARDS

6-8

Sixth Grade Algebra Grade Standards, Supporting Skills, and Examples

Indicator 1: Use procedures to transform algebraic expressions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>6.A.1.1. Students are able to use order of operations, excluding nested parentheses and exponents, to simplify whole number expressions.</p> <p>Examples:</p> <ol style="list-style-type: none"> 1) $7 + 4 \bullet 3 - 5$ 2) $2(3 + 5) + 7(\frac{10}{2})$ 3) Ms. Smith's class is going to the movies. Tickets cost \$3 for children and \$5 for adults. Write and simplify the expression that shows the cost for 20 children and 4 adults.
(Application)	<p>6.A.1.2. Students are able to write algebraic expressions involving addition or multiplication using whole numbers.</p> <ul style="list-style-type: none"> • Show multiplication in various forms: $2 \bullet 3$ or $2n$ or $2(3)$. <p>Example:</p> <ol style="list-style-type: none"> 1) A number increased by 6 2) Twice a number

Indicator 2: Use a variety of algebraic concepts and methods to solve equations and inequalities.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>6.A.2.1. Students are able to write and solve one-step 1st degree equations, with one variable, involving inverse operations using the set of whole numbers.</p> <p>Examples:</p> <ol style="list-style-type: none"> 1) Choose the correct answer to solve this equation using inverse operations, $x + 3 = 7$ <ol style="list-style-type: none"> a) $x + 3 = 7 - 3$ b) $x + 3 - 3 = 7 - 3$ c) $x + 3 - 3 = 7 - 7$ d) $x + 3 - 3 = 7 + 3$ 2) Write an equation for this statement and find the solution: Four times a number is eight.

Indicator 3: Interpret and develop mathematical models.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Knowledge)	6.A.3.1. Students are able to identify and graph ordered pairs in Quadrant I on a coordinate plane.
(Application)	<p>6.A.3.2. Students are able to solve one-step problems involving ratios and rates.</p> <p>Example: 15 ounces costs \$0.75. What does it cost for one ounce?</p>

Indicator 4: Describe and use properties and behaviors of relations, functions, and inverses.

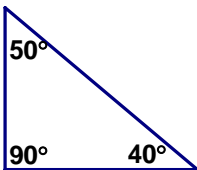
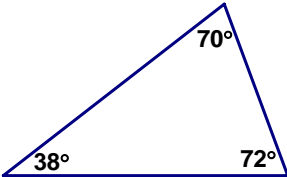
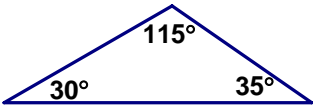

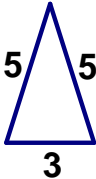
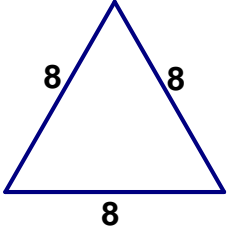
Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>6.A.4.1. Students are able to use concrete materials, graphs and algebraic statements to represent problem situations.</p> <ul style="list-style-type: none"> Recognize, describe, and extend arithmetic sequences and patterns. Example: Mary has one carnation. Every day she gets 3 more carnations. On the fifth day how many carnations does Mary have? Use variables to represent given quantities in problem situations. Example: A beetle has six legs. How many legs are on n beetles?




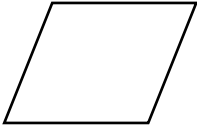
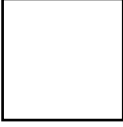
**Sixth Grade Algebra
Performance Descriptors**

Advanced	<p>Sixth grade students performing at the advanced level:</p> <ul style="list-style-type: none"> write and simplify 1st degree algebraic expressions, and solve 1st degree algebraic equations, using the set of whole numbers, and justify solution(s); apply unit rates.
Proficient	<p>Sixth grade students performing at the proficient level:</p> <ul style="list-style-type: none"> write and simplify 1st degree algebraic expressions, and solve 1st degree algebraic equations, using the set of whole numbers; find unit rate; identify and graph ordered pairs in Quadrant I on a coordinate plane.
Basic	<p>Sixth grade students performing at the basic level:</p> <ul style="list-style-type: none"> simplify 1st degree algebraic expressions, and solve 1st degree equations, using the set of whole numbers.

Sixth Grade Geometry
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use deductive and inductive reasoning to recognize and apply properties of geometric figures.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>6.G.1.1. Students are able to identify and describe the characteristics of triangles and quadrilaterals.</p> <ul style="list-style-type: none"> Identify and describe similarities and differences of triangles: Scalene Isosceles Equilateral Right Acute Obtuse <p>Example: Classify each triangle by its angles.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> <p>1)</p>  </div> <div style="text-align: center;"> <p>2)</p>  </div> <div style="text-align: center;"> <p>3)</p>  </div> </div> <p>Example: Classify each triangle by its side lengths.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> <p>1)</p>  </div> <div style="text-align: center;"> <p>2)</p>  </div> <div style="text-align: center;"> <p>3)</p>  </div> </div> <ul style="list-style-type: none"> Identify and describe similarities and differences of quadrilaterals: Trapezoid Parallelogram Rectangle Rhombus Square <p style="text-align: right;">(Example next page)</p>

	<p>Example: Classify each quadrilateral</p> <p>1)  2) </p> <p>3)  4)  5) </p>
(Comprehension)	<p>6.G.1.2. Students are able to identify and describe angles.</p> <ul style="list-style-type: none"> Identify and describe differences of angles: Acute Obtuse Right <p>Example: What is the difference between an acute angle and an obtuse angle?</p>

Indicator 2: Use properties of geometric figures to solve problems from a variety of perspectives.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>6.G.2.1. Students are able to use basic shapes to demonstrate geometric concepts.</p> <ul style="list-style-type: none"> Demonstrate lines of symmetry. Use basic shapes to demonstrate congruency (triangle, rectangle, square, parallelogram). Use basic shapes to demonstrate similarity (triangle, rectangle, square, parallelogram). Use basic shapes to demonstrate perpendicular lines (triangle, rectangle, square, trapezoid). Use basic shapes to demonstrate parallel lines (rectangles, squares, parallelograms). Identify a reflection.

**Sixth Grade Geometry
Performance Descriptors**

Advanced	Sixth grade students performing at the advanced level: <ul style="list-style-type: none">• develop and apply a variety of strategies and properties to analyze two-dimensional geometric figures.
Proficient	Sixth grade students performing at the proficient level: <ul style="list-style-type: none">• use geometric concepts to identify and describe characteristics of lines, angles, triangles, and quadrilaterals.
Basic	Sixth grade students performing at the basic level: <ul style="list-style-type: none">• identify characteristics of lines, angles, triangles, and quadrilaterals.

**Sixth Grade Measurement
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Apply measurement concepts in practical applications.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>6.M.1.1. Students are able to select, use, and convert appropriate unit of measurement for a situation.</p> <ul style="list-style-type: none"> • Determine elapsed time. Example: Alfredo went to the park at 11:15 a.m. and came home at 2:00 p.m. How long was he at the park? • Convert length, capacity, and mass within the Metric system (kilo-, base unit, centi-, milli-). • Convert weight and length within U.S. Customary system. ✓ <i>Convert capacity within U.S. Customary system (fluid ounce, cup, pint, quart, gallon).</i> ✓ <i>Measure angles.</i>
(Comprehension)	<p>6.M.1.2. Students are able to find the perimeter and area of squares and rectangles (whole number measurements).</p> <ul style="list-style-type: none"> • Apply strategies and/or formulas. • Use appropriate unit of measure.

**Sixth Grade Measurement
Performance Descriptors**

Advanced	<p>Sixth students performing at the advanced level:</p> <ul style="list-style-type: none"> • convert units of measure; • use perimeter and area formulas to solve problems.
Proficient	<p>Sixth grade students performing at the proficient level:</p> <ul style="list-style-type: none"> • convert basic units of measure; • select and use the appropriate formula to find the perimeter and area of selected polygons.
Basic	<p>Sixth grade students performing at the basic level:</p> <ul style="list-style-type: none"> • convert units of weight and length (inches, feet, and yards) in the U.S. Customary system; • given the formula find the perimeter and area of selected polygons.

**Sixth Grade Number Sense
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>6.N.1.1. Students are able to represent fractions in equivalent forms and convert between fractions, decimals, and percents using halves, fourths, tenths, hundredths.</p> <p>Examples:</p> <p>1) Write $\frac{1}{2}$ as a decimal and a percent.</p> <p>2) In the following equation, what value of x would make the relationship true? $\frac{1}{2} = \frac{x}{8}$</p> <p>3) Choose the number that represents $\frac{1}{4}$:</p> <p>a) 0.4 b) 1.4 c) 0.14 d) 0.25 e) 2.5</p> <ul style="list-style-type: none"> Identify both standard and word forms (millions to ten-thousandths) of positive rational numbers. ✓ <i>Identify, represent, compare, and order rational numbers and represent them on a number line.</i> ✓ <i>Describe and compare two numbers using ratios including appropriate notation, e.g., $a:b$, $\frac{a}{b}$, a to b.</i>
(Knowledge)	<p>6.N.1.2. Students are able to find factors and multiples of whole numbers.</p> <p>Examples: The area of a rectangle is 24 square units. What are the possible whole number dimensions?</p> <ul style="list-style-type: none"> Classify numbers as prime or composite.

Indicator 2: Apply number operations with real numbers and other number systems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	6.N.2.1. Students are able to add, subtract, multiply, and divide decimals. <i>✓ Operations with fractions and integers.</i>

Indicator 3: Develop conjectures, predictions, or estimations to solve problems and verify or justify the results.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	6.N.3.1. Students are able to use various strategies to solve one- and two-step problems involving positive decimals. <ul style="list-style-type: none"> • Formulate rules to solve practical problems (problem solving). • Use estimation strategies to make predictions and test the reasonableness of answer. • Explain strategies and justify answers. <p>Example: Tom bought one pair of jeans for \$19.95 and 2 shirts for \$14.99 each. He gave the clerk \$60.00. What is his change? Explain the strategy and justify the answer.</p>

**Sixth Grade Number Sense
Performance Descriptors**

Advanced	Sixth grade students performing at the advanced level: <ul style="list-style-type: none"> • justify problem-solving strategies used in two-step situations with decimals; • apply problem-solving strategies using factors and multiples with the set of whole numbers.
Proficient	Sixth grade students performing at the proficient level: <ul style="list-style-type: none"> • read, represent, estimate, and calculate decimals; • apply problem-solving strategies in one- and two-step situations with decimals; • represent numbers in a variety of forms; • find factors and multiples using the set of whole numbers.
Basic	Sixth grade students performing at the basic level: <ul style="list-style-type: none"> • read, represent, estimate, and calculate whole numbers; • apply problem-solving strategies in one-step situations using the set of whole numbers; • find multiples using the set of whole numbers.

Sixth Grade Statistics & Probability
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use statistical models to gather, analyze, and display data to draw conclusions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples																		
(Comprehension)	<p>6.S.1.1. Students are able to find the mean, mode, and range of an ordered set of positive data.</p> <p>Example: Find the mean, mode, and range of the following test scores: 72, 76, 82, 82, 87, 90, 92</p> <p>√ Find the median.</p>																		
(Application)	<p>6.S.1.2. Students are able to display data using bar and line graphs and draw conclusions from data displayed in a graph.</p> <p>Example: The sixth grade science class recorded the outside temperature each hour. Using the graph, answer the following questions:</p> <ol style="list-style-type: none"> 1) Between what two times did the temperature increase the most? 2) Estimate the temperature at 9:30 am. <div data-bbox="634 1121 1321 1646"> <p>Temperature on May 10</p> <table border="1"> <caption>Temperature Data from Graph</caption> <thead> <tr> <th>Time</th> <th>Fahrenheit Temperature</th> </tr> </thead> <tbody> <tr> <td>8am</td> <td>20</td> </tr> <tr> <td>9am</td> <td>30</td> </tr> <tr> <td>10am</td> <td>40</td> </tr> <tr> <td>11am</td> <td>50</td> </tr> <tr> <td>12noon</td> <td>60</td> </tr> <tr> <td>1pm</td> <td>75</td> </tr> <tr> <td>2pm</td> <td>75</td> </tr> <tr> <td>3pm</td> <td>70</td> </tr> </tbody> </table> </div>	Time	Fahrenheit Temperature	8am	20	9am	30	10am	40	11am	50	12noon	60	1pm	75	2pm	75	3pm	70
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3pm	70																		

Indicator 2: Apply the concepts of probability to predict events/outcomes and solve problems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Knowledge)	6.S.2.1. Students are able to find the probability of a simple event. <ul style="list-style-type: none"> Express the result as a fraction. Example: What is the probability that the number is greater than four on a number cube labeled one through six.

**Sixth Grade Statistics & Probability
Performance Descriptors**

Advanced	Sixth grade students performing at the advanced level: <ul style="list-style-type: none"> represent data in bar and line graphs and draw conclusions from those graphs; make predictions from a given graph; find measures of central tendency from a set of data; find the probability of a simple event.
Proficient	Sixth grade students performing at the proficient level: <ul style="list-style-type: none"> represent data in bar and line graphs and draw conclusions from a given graph; find mean, mode, and range of an ordered set of data; find the probability of a simple event given pictorial representation.
Basic	Sixth grade students performing at the basic level: <ul style="list-style-type: none"> draw bar and line graphs given appropriate scales; find mode and range of an ordered set of data; find the possible outcomes of a simple event given pictorial representation.

Seventh Grade Algebra
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use procedures to transform algebraic expressions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>7.A.1.1. Students are able to write and evaluate algebraic expressions using the set of whole numbers.</p> <p>Example: Write and evaluate the expression needed to solve the problem: Mary's hockey team won twice as many games as they lost. They lost 5 games. How many games did they win?</p> <ul style="list-style-type: none"> • Use replacement values for variables. Examples: 1) Evaluate $2x^2 + 7$ if $x = 4$ 2) Evaluate $\frac{8b}{a}$ if $a = 6$ and $b = 3$ • Use order of operations. Example: Evaluate $9a - (4b + 2c)$ if $a = 6$, $b = 3$, and $c = 7$
(Knowledge)	<p>7.A.1.2. Students are able to identify associative, commutative, distributive, and identity properties involving algebraic expressions.</p> <p>Examples: Name the property shown by the statements in the problems below.</p> <ol style="list-style-type: none"> 1) $5s + 9 = 9 + 5s$ 2) $(7a)b = 7(ab)$ 3) $22 \bullet 1 = 22$ 4) $x + 0 = x$ 5) $5(a + b) = 5a + 5b$ <p>✓ <i>Use the associative, commutative, distributive, and identity properties.</i></p>

Indicator 2: Use a variety of algebraic concepts and methods to solve equations and inequalities.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>7.A.2.1. Students are able to write and solve one-step 1st degree equations, with one variable, using the set of integers and inequalities, with one variable, using the set of whole numbers.</p> <p>Examples:</p> <ol style="list-style-type: none"> 1) Solve $-3x = 15$ 2) Solve $3x \geq 6$ <p>Examples: Write and solve</p> <ol style="list-style-type: none"> 1) Eight less than a number is -5. 2) The sum of a number and 6 is greater than 12. <ul style="list-style-type: none"> • Addition property of equality. • Multiplication property of equality. • Inverse operations.

Indicator 3: Interpret and develop mathematical models.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>7.A.3.1. Students are able to identify and graph ordered pairs on a coordinate plane and inequalities on a number line.</p> <ul style="list-style-type: none"> • Quadrants I-IV • Use a scatterplot to draw an approximate line of best fit in a coordinate plane.
(Application)	<p>7.A.3.2. Students are able to model and solve multi-step problems involving rates.</p> <ul style="list-style-type: none"> • Better buy Example: Which represents the least expensive price per candy bar? <ol style="list-style-type: none"> a. 3 candy bars for \$ 1.00 b. 4 candy bars for \$ 1.50 c. 5 candy bars for \$ 2.00 d. 6 candy bars for \$ 2.50 • Unit rates Example: Tell which unit rate is greater: Fred rollerblades 4 miles in 32 minutes. Eden rollerblades 2 miles in 18 minutes.

Indicator 4: Describe and use properties and behaviors of relations, functions, and inverses.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples										
(Application)	7.A.4.1. Students are able to recognize one-step patterns using tables, graphs, and models and create one-step algebraic expressions representing the pattern.										
	Example: 1) Complete the table and write an algebraic expression for the given table.										
	<table><tr><td>X</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Y</td><td>7</td><td>14</td><td>21</td><td>?</td></tr></table>	X	1	2	3	4	Y	7	14	21	?
	X	1	2	3	4						
Y	7	14	21	?							
Example: 2) Complete the table and write an algebraic expression for the given table.											

X	Y
1	5
2	6
3	7
4	?

- Identify arithmetic and geometric sequences.
- Extend arithmetic and geometric sequences.

Example: Is this an arithmetic or geometric sequence or neither?
Write the next three terms in the sequence.

3, 7, 11, 15, __ , __ , __ .

**Seventh Grade Algebra
Performance Descriptors**

Advanced	Seventh grade students performing at the advanced level: <ul style="list-style-type: none"> • simulate situations using 1st degree algebraic statements using the set of whole numbers, in order to justify solution(s); • model and solve multi-step problems involving rates and justify the reasoning; • write the inequality statement.
Proficient	Seventh grade students performing at the proficient level: <ul style="list-style-type: none"> • write, simplify, and solve 1st degree algebraic statements using the set of whole numbers; • model and solve multi-step problems involving rates; • identify and graph ordered pairs on a coordinate plane and inequalities on a number line.
Basic	Seventh grade students performing at the basic level: <ul style="list-style-type: none"> • simplify and solve one-step 1st degree algebraic statements using the set of whole numbers; • find unit rates; • graph ordered pairs in Quadrant I on a coordinate plane.

**Seventh Grade Geometry
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Use deductive and inductive reasoning to recognize and apply properties of geometric figures.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>7.G.1.1. Students are able to identify, describe, and classify polygons having up to 10 sides.</p> <ul style="list-style-type: none"> • Relationships among triangles. Example: Can an equilateral triangle contain an obtuse angle? Why/why not? • Relationships among quadrilaterals. Example: Is a square a type of rectangle? • Sketch two-dimensional figures.
(Knowledge)	<p>7.G.1.2. Students are able to identify and describe elements of geometric figures.</p> <ul style="list-style-type: none"> • Altitude • Midpoint • Bisector • Radius • Diameter • Chord

Indicator 2: Use properties of geometric figures to solve problems from a variety of perspectives.

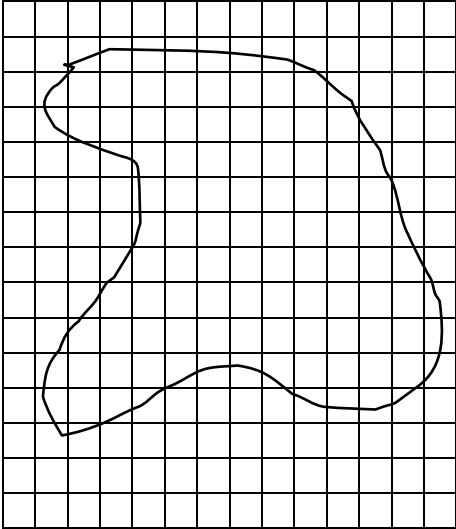
Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>7.G.2.1. Students are able to demonstrate ways that shapes can be transformed.</p> <ul style="list-style-type: none"> • Translation • Rotation • Reflection <p>√ Tessellation</p> <p>√ Write and solve proportions that express the relationships between corresponding parts of similar quadrilaterals and triangles.</p>

**Seventh Grade Geometry
Performance Descriptors**

Advanced	<p>Seventh grade students performing at the advanced level:</p> <ul style="list-style-type: none"> • analyze two-dimensional shapes using their properties and relationships; • predict the results of two-dimensional transformations.
Proficient	<p>Seventh grade students performing at the proficient level:</p> <ul style="list-style-type: none"> • describe and classify two-dimensional shapes using their properties and relationships; • transform two-dimensional geometric figures.
Basic	<p>Seventh grade students performing at the basic level:</p> <ul style="list-style-type: none"> • identify properties and elements of basic two-dimensional shapes.

**Seventh Grade Measurement
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Apply measurement concepts in practical applications.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>7.M.1.1. Students are able to select, use, and convert appropriate units of measurement for a situation including capacity and angle measurement.</p> <ul style="list-style-type: none"> • Measure angles $\leq 180^\circ$ to the nearest degree. • Measure length, capacity, and mass. • Convert within the Metric system (kilo- thru milli-). • Convert within the U.S. Customary system (weight, length, capacity).
(Comprehension)	<p>7.M.1.2. Students, when given the formulas, are able to find circumference, perimeter, and area of circles, parallelograms, triangles, and trapezoids (whole number measurements).</p> <ul style="list-style-type: none"> • Use appropriate unit of measure. • Estimate the area of irregular shapes. <p>Example: Use a grid to find the approximate area of the lake.</p> 

**Seventh Grade Measurement
Performance Descriptors**

Advanced	Seventh students performing at the advanced level: <ul style="list-style-type: none">• use perimeter, circumference, and area formulas to solve problems;• select, use, and convert appropriate units of measure to solve problems;• draw and use grids to estimate the area of a shape.
Proficient	Seventh grade students performing at the proficient level: <ul style="list-style-type: none">• select and use the appropriate formula to find the perimeter, circumference, and area of a shape;• select and use appropriate units of measure;• convert units of measure.
Basic	Seventh grade students performing at the basic level: <ul style="list-style-type: none">• given the formula find the perimeter and area of a shape;• select appropriate units of measure.

**Seventh Grade Number Sense
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>7.N.1.1. Students are able to represent numbers in a variety of forms by describing, ordering, and comparing integers, decimals, percents, and fractions.</p> <p>Examples:</p> <ol style="list-style-type: none"> 1) Arrange in order from least to greatest 2, $\frac{1}{2}$, 1.5, 75%. 2) Choose the number that is closest to $\frac{1}{4}$: a) 0.4 b) 1.4 c) 0.14 d) 0.3 e) 2.5 3) Suppose a recipe calls for $\frac{3}{4}$ c. sugar. Juanita has the following measuring cups: 1 cup, $\frac{1}{2}$ cup, $\frac{1}{3}$ cup, $\frac{1}{4}$ cup, $\frac{1}{8}$ cup, and a tablespoon ($\frac{1}{16}$ cup). Record different ways to measure $\frac{3}{4}$ cup. <ul style="list-style-type: none"> • Describe and compare numbers using ratios including appropriate notation, e.g., a:b, $\frac{a}{b}$, a to b. <p>✓ <i>Scientific notation, calculator notation.</i> ✓ <i>Include percents less than one and greater than 100.</i> ✓ <i>Identify, represent, compare, and order rational numbers and represent them on a number line.</i></p>
(Application)	<p>7.N.1.2. Students are able to find and use common multiples and factors of whole numbers.</p> <p>Examples:</p> <ol style="list-style-type: none"> 1) List the 1st five multiples of each of these numbers: 5, 8 and 2. <ul style="list-style-type: none"> • Least Common Multiple Example: 1) Find the Least Common Multiple of 2, 3 and 5. • Greatest Common Factor Example: Find the Greatest Common Factor of 6 and 42.

	<ul style="list-style-type: none"> Divisibility rules (2, 3, 4, 6, 9, 10). <p>Example:</p> <ol style="list-style-type: none"> Write a digit in the blank so that the entire number is divisible by 3. 5 <u> </u> 203 Will any other digits work? Explain your thinking.
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Indicator 2: Apply number operations with real numbers and other number systems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>7.N.2.1. Students are able to add, subtract, multiply, and divide integers and positive fractions.</p> <p>Examples:</p> <ol style="list-style-type: none"> Sue received \$100 from her mom for shopping. On a recent shopping trip to the mall she spent \$55 at the clothing store and \$28 at the jewelry store. What was her financial status at the end of the afternoon? Was it positive or negative? Use integers to solve. Suppose Cody jogged $\frac{3}{4}$ mile yesterday and $1\frac{1}{8}$ miles today. How much did he jog all together? How much farther did he jog today than yesterday? Emerick bought a $3\frac{1}{2}$ pound package of hamburger. How many $\frac{1}{2}$ pound burgers can you make? Explain the strategy used.

Indicator 3: Develop conjectures, predictions, or estimations to solve problems and verify or justify the results.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>7.N.3.1. Students are able to use various strategies to solve one- and two-step problems involving positive fractions and integers.</p> <p>Example:</p> <p>Bill received \$200 for his birthday. He spent $\frac{1}{4}$ of it on new CDs. Does he have enough to buy a \$178.99 T.V. set? Explain.</p> <ul style="list-style-type: none"> • Formulate rules to solve practical problems involving integers (problem solving). • Use estimation strategies to make predictions and test the reasonableness of the answer. • Explain strategies and justify answers.

**Seventh Grade Number Sense
Performance Descriptors**

Advanced	<p>Seventh grade students performing at the advanced level:</p> <ul style="list-style-type: none"> • justify problem-solving strategies used in multi-step situations with integers and positive fractions.
Proficient	<p>Seventh grade students performing at the proficient level:</p> <ul style="list-style-type: none"> • read, represent, estimate, and calculate with integers and positive fractions; • find and use least common multiples and greatest common factors; • apply problem-solving strategies in one- and two-step situations with integers and positive fractions.
Basic	<p>Seventh grade students performing at the basic level:</p> <ul style="list-style-type: none"> • read, represent, estimate, and calculate decimals; • find common factors and multiples; • apply problem solving strategies in one- and two-step situations with decimals.

Seventh Grade Statistics & Probability
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use statistical models to gather, analyze, and display data to draw conclusions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples																																																		
(Comprehension)	<p>7.S.1.1. Students are able to find the mean, median, mode, and range of a set of data.</p> <p>Example: Find the mean, median, mode, and range of the following set of data.</p> <table><tr><th colspan="7">Daily High Temperatures</th></tr><tr><th>S</th><th>M</th><th>T</th><th>W</th><th>T</th><th>F</th><th>S</th></tr><tr><td>62</td><td>58</td><td>55</td><td>65</td><td>62</td><td>67</td><td>72</td></tr></table>	Daily High Temperatures							S	M	T	W	T	F	S	62	58	55	65	62	67	72																													
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S	M	T	W	T	F	S																																													
62	58	55	65	62	67	72																																													
(Application)	<p>7.S.1.2. Students are able to display data, using frequency tables, line plots, stem-and-leaf plots, and make predictions from data displayed in a graph.</p> <p>Example: If Tanja had a typical game, how many points could she expect to score? Explain your reasoning.</p> <p style="text-align: center;">Tanja's Points Scored Per Basketball Game</p> <table><tr><td>0</td><td> </td><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1</td><td> </td><td>0</td><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2</td><td> </td><td>1</td><td>1</td><td>2</td><td>5</td><td>5</td><td>5</td><td>8</td><td></td></tr><tr><td>3</td><td> </td><td>2</td><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td> </td><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	0		7								1		0	8							2		1	1	2	5	5	5	8		3		2	3							4		0							
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Indicator 2: Apply the concepts of probability to predict events/outcomes and solve problems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>7.S.2.1. Students are able, given a sample space, to find the probability of a specific outcome.</p> <ul style="list-style-type: none"> Simple probability. Example: In a bag with 5 blue, 7 red, and 3 green marbles, what is the probability of not getting a blue marble? Express probability as a ratio, decimal, or percent.

**Seventh Grade Statistics & Probability
Performance Descriptors**

Advanced	<p>Seventh grade students performing at the advanced level:</p> <ul style="list-style-type: none"> organize and represent data in various forms and use results to make predictions; find measures of central tendency; make predictions using theoretical probability of an independent event.
Proficient	<p>Seventh grade students performing at the proficient level:</p> <ul style="list-style-type: none"> organize and represent data in various forms and make predictions from given graphs; find measures of central tendency given a set of data; find the probability of a simple event.
Basic	<p>Seventh grade students performing at the basic level:</p> <ul style="list-style-type: none"> represent data in various forms; find mean, mode, and range of a given set of data; find the probability of a simple event given pictorial representation.

Eighth Grade Algebra
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use procedures to transform algebraic expressions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>8.A.1.1. Students are able to use properties to expand, combine, and simplify 1st degree algebraic expressions with the set of integers.</p> <ul style="list-style-type: none"> • Properties include associative, commutative, distributive, and identity properties. • Use order of operations with exponents and nested parentheses. <p>Examples: Simplify the following expressions:</p> <p>1) $3(-2z + x)$</p> <p>2) $3 + 2(5x - (-2x))$</p> <p>3) $\frac{8x}{2}$</p> <ul style="list-style-type: none"> • Determine if two 1st degree algebraic expressions are equivalent. <p>Example:</p> <p>Is $3(x + 2)$ equivalent to $\frac{9x}{3} + 6$?</p>

Indicator 2: Use a variety of algebraic concepts and methods to solve equations and inequalities.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>8.A.2.1. Students are able to write and solve two-step 1st degree equations, with one variable, and one-step inequalities, with one variable, using the set of integers.</p> <p>Examples: Solve</p> <p>1) $\frac{x}{2} - (-2) = -5$</p> <p>2) $x - (-5) \leq 7$</p>

	<p>Examples: Write and solve</p> <ol style="list-style-type: none"> 1) Five less than four times a number is thirteen. 2) A number divided by negative seven is less than or equal to fourteen. <ul style="list-style-type: none"> • Inverse operations • Addition property of equality. • Multiplication property of equality.
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Indicator 3: Interpret and develop mathematical models.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>8.A.3.1. Students are able to describe and determine linear relationships.</p> <ul style="list-style-type: none"> • Determine slope from a line or ordered pairs on a graph. • Identify x and y intercepts from a graph.

Indicator 4: Describe and use properties and behaviors of relations, functions, and inverses.

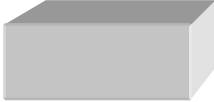
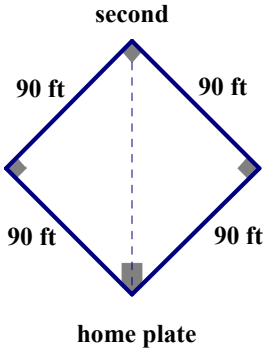
Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Synthesis)	<p>8.A.4.1. Students are able to create rules to explain the relationship between numbers when a change in the first variable affects the second variable.</p> <p>Example:</p> <ol style="list-style-type: none"> 1) $x + y = 10$. As x increases what happens to y? 2) In the equation $y = 6x$, what is the effect on the value of y if the value of x is doubled?
(Analysis)	<p>8.A.4.2. Students are able to describe and represent relations using tables, graphs, and rules.</p> <ul style="list-style-type: none"> • Represent situations with patterns and relations to find exact or approximate solutions to problems. • Make predictions relating two variables using a rule or a graph.

**Eighth Grade Algebra
Performance Descriptors**

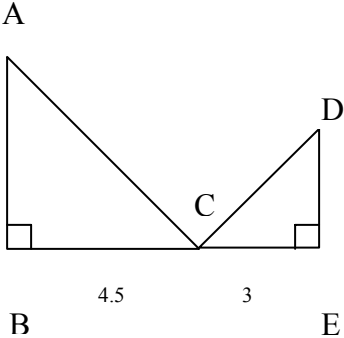
Advanced	Eighth grade students performing at the advanced level: <ul style="list-style-type: none">• represent using 1st degree algebraic statements using integers, tables, and graphs, in order to justify solution(s).
Proficient	Eighth grade students performing at the proficient level: <ul style="list-style-type: none">• simulate situations using 1st degree algebraic statements using integers, tables, and graphs in order to determine solution(s).
Basic	Eighth grade students performing at the basic level: <ul style="list-style-type: none">• simplify, solve, and graph 1st degree algebraic statements using whole numbers.

Eighth Grade Geometry
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use deductive and inductive reasoning to recognize and apply properties of geometric figures.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>8.G.1.1. Students are able to describe and classify prisms, pyramids, cylinders, and cone.</p> <p>Example: Classify the solid. How many edges does it have? How many vertices? How many faces does it have?</p>  <ul style="list-style-type: none"> • Faces, edges, and vertices. <p>✓ <i>Nets.</i></p>
(Application)	<p>8.G.1.2. Students, when given any two sides of an illustrated right triangle, are able to use the Pythagorean Theorem to find the third side.</p> <p>Example: A baseball diamond is a square. How far does the catcher have to throw when he throws the ball to second?</p>  <ul style="list-style-type: none"> • Given the formula. • Using whole numbers for the known values.

Indicator 2: Use properties of geometric figures to solve problems from a variety of perspectives.

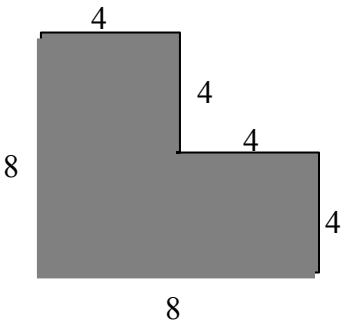
Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>8.G.2.1. Students are able to write and solve proportions that express the relationships between corresponding parts of similar quadrilaterals and triangles.</p> <p>Examples:</p> <ol style="list-style-type: none"> 1) A rectangle has a width of 5 cm and a length of 7 cm. A similar rectangle is 12 cm in width. What is the length of the rectangle? 2) Given $\triangle ABC \sim \triangle DEC$, find the length of side AB. <div style="text-align: center;">  </div> <ol style="list-style-type: none"> 3) A frame of a movie film is 35 mm wide and 26.25 mm high. The film projects an image 8 m wide on a movie screen. How high is the image?

**Eighth Grade Geometry
Performance Descriptors**

Advanced	<p>Eighth grade students performing at the advanced level:</p> <ul style="list-style-type: none"> • sketch, and analyze characteristics of three-dimensional shapes applying properties and relationships; • sketch and analyze characteristics of two-dimensional shapes applying properties and proportional relationships.
Proficient	<p>Eighth grade students performing at the proficient level:</p> <ul style="list-style-type: none"> • compare characteristics of three-dimensional shapes using given formulas, properties, and relationships; • compare two-dimensional shapes using given formulas, properties, and proportional relationships.
Basic	<p>Eighth grade students performing at the basic level:</p> <ul style="list-style-type: none"> • identify and compare characteristics of basic two- and three-dimensional shapes given specific formulas, properties, and proportional relationships.

**Eighth Grade Measurement
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Apply measurement concepts in practical applications.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>8.M.1.1. Students are able to apply proportional reasoning to solve measurement problems with rational number measurements.</p> <ul style="list-style-type: none"> • Conversion within measurement systems. • Use scale drawings to represent situations. • Indirect measurement. <p>Examples:</p> <ol style="list-style-type: none"> 1) One of the models of King Kong was 18 inches tall. How tall was King Kong in the movie if the scale is 3 in. = 4 ft.? 2) A lake front building that is 26 ft. high casts a shadow on the water. How long is the shadow if a 10 ft. high truck parked nearby casts a 7 ft. shadow?
(Comprehension)	<p>8.M.1.2. Students are able to find area, volume, and surface area with whole number measurements.</p> <ul style="list-style-type: none"> • Use appropriate unit of measure • Apply strategies and/or formulas. • Volume of rectangular prisms, rectangular pyramids, cylinders, and cones. • Surface area of rectangular prisms and cylinders. • Area of composite shapes. <p>Example: Find the area of the figure.</p> 

**Eighth Grade Measurement
Performance Descriptors**

Advanced	Eighth students performing at the advanced level: <ul style="list-style-type: none">• solve measurement problems without pictorial representation;• apply formulas for volume and surface area to solve problems;• write appropriate formulas to find the area of composite shapes.
Proficient	Eighth grade students performing at the proficient level: <ul style="list-style-type: none">• solve measurement problems given pictorial representation;• select and use formulas to find volume and surface area;• find area of composite shapes.
Basic	Eighth grade students performing at the basic level: <ul style="list-style-type: none">• convert units within a measurement system;• find area and volume given the formula.

Eighth Grade Number Sense
Grade Standards, Supporting Skills, and Examples

Indicator 1: Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>8.N.1.1. Students are able to represent numbers in a variety of forms and identify the subsets of rational numbers.</p> <ul style="list-style-type: none"> • Exponents • Scientific notation • Absolute value • Radicals (perfect squares) • Graph on a number line <p>Example: Choose four numbers between two and three and place them on a number line.</p> <p>√ <i>Explain the effects of operations on the magnitude of rational numbers.</i> Example: Use an area model to show that multiplying 5 by a number >1 results in an answer >5, but multiplying 5 by a number <1 results in an answer <5.</p> <p>√ <i>Multiplication and division of an inequality by a negative number.</i></p>

Indicator 2: Apply number operations with real numbers and other number systems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>8.N.2.1. Students are able to read, write, and compute within any subset of rational numbers.</p> <ul style="list-style-type: none"> Solve problems involving discount, markup, commission, profit, and simple interest. <p>Example: The school store buys notebooks for \$.30. They sell them for \$.50. What is the percent of markup on each notebook? If they sell 170 notebooks, what is their profit?</p>

Indicator 3: Develop conjectures, predictions, or estimations to solve problems and verify or justify the results.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>8.N.3.1. Students are able to use various strategies to solve multi-step problems involving rational numbers.</p> <p>Examples:</p> <ol style="list-style-type: none"> 1) A soccer team won 48 of its first 80 games. How many of its next 50 games must the team win in order to maintain the ratio of wins to losses? 2) A certain rectangle has whole number dimensions in inches and the ratio of its length to width is 4 to 3. Its area is 300 square inches. What is the length and width of the rectangle? <ul style="list-style-type: none"> Explain strategies and justify answers. Formulate rules to solve practical problems involving rational numbers. Use estimation strategies to make predictions and test the reasonableness of the answer. <p>Example: Estimate $\sqrt{20}$</p> <p>✓ <i>Formulate counter-examples to disclaim given assertions.</i></p>

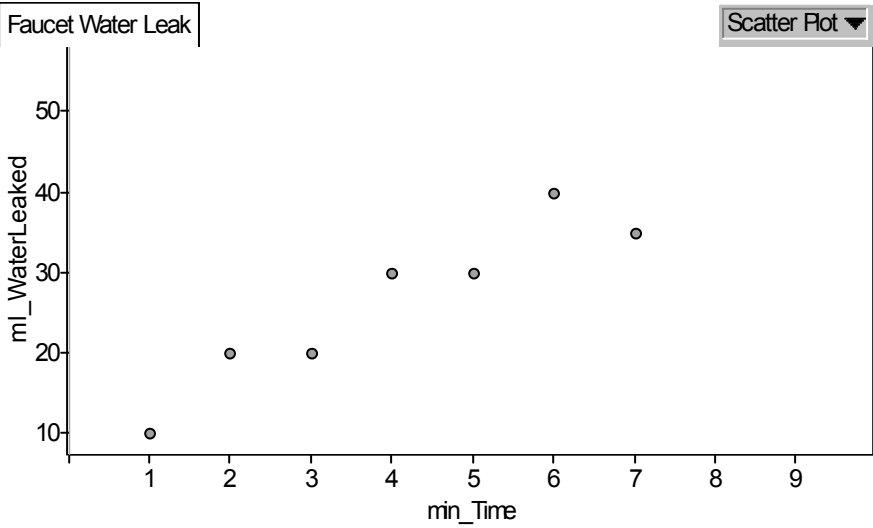
**Eighth Grade Number Sense
Performance Descriptors**

Advanced	Eighth grade students performing at the advanced level: <ul style="list-style-type: none">• justify problem-solving strategies used in multi-step situations within the set of rational numbers.
Proficient	Eighth grade students performing at the proficient level: <ul style="list-style-type: none">• read, represent, estimate, and calculate using the set of rational numbers;• apply problem-solving strategies in multi-step situations using the set of rational numbers.
Basic	Eighth grade students performing at the basic level: <ul style="list-style-type: none">• read, represent, estimate, and calculate integers and positive fractions;• apply problem-solving strategies in one- and two-step situations with integers and positive fractions.

Eighth Grade Statistics & Probability
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use statistical models to gather, analyze, and display data to draw conclusions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
(Comprehension)	<p>8.S.1.1. Students are able to find the mean, median, mode, and range of a data set from a stem-and-leaf plot and a line plot.</p> <p>Example: Find the mean, median, mode, and range of the given data.</p> <p>1) Average Speed:</p> <table><tr><td>5</td><td> </td><td>8 9 9 9</td></tr><tr><td>6</td><td> </td><td>0 0 0 2 2 5 6 7 8 8 9</td></tr><tr><td>7</td><td> </td><td>0 0 0 1 1 1 1 2 2 3 5</td></tr></table> <p>Key: 5 8 means 58 mph</p> <p>2) Hours Spent on Homework</p> <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td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(Application)	<p>8.S.1.2. Students are able to use a variety of visual representations to display data to make comparisons and predictions.</p> <ul style="list-style-type: none"> • Double bar graph • Double line graph • Scatterplot <p>Example: At 10 minutes, predict the amount of water that had been leaked.</p> 
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Indicator 2: Apply the concepts of probability to predict events/outcomes and solve problems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>8.S.2.1. Students are able to find the sample space and compute probability for two simultaneous independent events.</p> <p>Examples:</p> <ol style="list-style-type: none"> 1) What is the probability of getting a head and a three when flipping a coin and rolling a number cube? 2) Jamie has three different colored shirts and two different colored pairs of pants. Using a tree diagram, table or organized list, find how many different outfits she can make. <ul style="list-style-type: none"> • Express probability as a ratio, decimal, or percent.

**Eighth Grade Statistics & Probability
Performance Descriptors**

Advanced	Eighth grade students performing at the advanced level: <ul style="list-style-type: none">• choose the measure of central tendency that best represents the data;• make predictions using probability for two independent events.
Proficient	Eighth grade students performing at the proficient level: <ul style="list-style-type: none">• represent data in various forms and use results to make predictions and comparisons;• find measures of central tendency;• compute the probability for two independent events.
Basic	Eighth grade students performing at the basic level: <ul style="list-style-type: none">• represent data in various forms;• find the mean and mode of a given set of data;• find the probability of a simple event.

ALGEBRA STANDARDS 6-8

Indicator 1: Use procedures to transform algebraic expressions.

Sixth Grade	Seventh Grade	Eighth Grade:
6.A.1.1. (Application) Use order of operations, excluding nested parentheses and exponents, to simplify whole number expressions.	7.A.1.1. (Application) Write and evaluate algebraic expressions using the set of whole numbers.	8.A.1.1. (Application) Use properties to expand, combine, and simplify 1 st degree algebraic expressions with the set of integers.
6.A.1.2. (Application) Write algebraic expressions involving addition or multiplication using whole numbers.	7.A.1.2. (Knowledge) Identify associative, commutative, distributive, and identity properties involving algebraic expressions.	

Indicator 2: Use a variety of algebraic concepts and methods to solve equations and inequalities.

Sixth Grade	Seventh Grade	Eighth Grade
6.A.2.1. (Application) Write and solve one-step 1 st degree equations, with one variable, involving inverse operations using the set of whole numbers.	7.A.2.1. (Application) Write and solve one-step 1 st degree equations, with one variable, using the set of integers and inequalities, with one variable, using the set of whole numbers.	8.A.2.1. (Application) Write and solve two-step 1 st degree equations, with one variable, and one-step inequalities, with one variable, using the set of integers.

Indicator 3: Interpret and develop mathematical models.

Sixth Grade	Seventh Grade	Eighth Grade
6.A.3.1. (Knowledge) Identify and graph ordered pairs in Quadrant I on a coordinate plane.	7.A.3.1. (Application) Identify and graph ordered pairs on a coordinate plane and inequalities on a number line.	8.A.3.1. (Comprehension) Describe and determine linear relationships.

6.A.3.2. (Application) Solve one-step problems involving ratios and rates.	7.A.3.2. (Application) Model and solve multi-step problems involving rates.	
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Indicator 4: Analyze and describe the properties and behaviors of relations, functions, and their inverses.

Sixth Grade	Seventh Grade	Eighth Grade
6.A.4.1. (Comprehension) Use concrete materials, graphs, and algebraic statements to represent problem situations.	7.A.4.1. (Application) Recognize one-step patterns using tables, graphs, and models and create one-step algebraic expressions representing the pattern.	8.A.4.1. (Synthesis) Create rules to explain the relationship between numbers when a change in the first variable affects the second variable.
		8.A.4.2. (Analysis) Describe and represent relations using tables, graphs, and rules.

GEOMETRY STANDARDS

6-8

Indicator 1: Use deductive and inductive reasoning to recognize and apply properties of geometric figures.

Sixth Grade	Seventh Grade	Eighth Grade
6.G.1.1. (Comprehension) Identify and describe the characteristics of triangles and quadrilaterals.	7.G.1.1. (Application) Identify, describe, and classify polygons having up to 10 sides.	8.G.1.1. Describe and classify prisms, pyramids, cylinders, and cones.
6.G.1.2. (Comprehension) Identify and describe angles.	7.G.1.2. (Knowledge) Identify and describe elements of geometric figures.	8.G.1.2. (Application) Given any two sides of an illustrated right triangle, use the Pythagorean Theorem to find the third side.

Indicator 2: Use properties of geometric figures to solve problems from a variety of perspectives

Sixth Grade	Seventh Grade	Eighth Grade
6.G.2.1. (Application) Use basic shapes to demonstrate geometric concepts.	7.G.2.1. (Application) Demonstrate ways that shapes can be transformed.	8.G.2.1. (Application) Write and solve proportions that express the relationships between corresponding parts of similar quadrilaterals and triangles.

MEASUREMENT STANDARDS 6-8

Indicator 1: Apply measurement concepts in practical applications.

Sixth Grade	Seventh Grade	Eighth Grade
6.M.1.1. (Comprehension) Select, use, and convert appropriate unit of measurement for a situation.	7.M.1.1. (Comprehension) Select, use, and convert appropriate unit of measurement for a situation including capacity and angle measurement.	8.M.1.1. (Application) Apply proportional reasoning to solve measurement problems with rational number measurements.
6.M.1.2. (Comprehension) Find the perimeter and area of squares and rectangles (whole number measurements).	7.M.1.2. (Comprehension) Given the formulas, find the circumference, perimeter, and area of circles, parallelograms, triangles, and trapezoids (whole number measurement).	8.M.1.2. (Comprehension) Find area, volume, and surface area with whole number measurements.

NUMBER SENSE STANDARDS

6-8

Indicator 1: Use the structural characteristics of the set of real numbers and its various subsets. Apply the concept of value, magnitude, and relative magnitude of real numbers.

Sixth Grade	Seventh Grade	Eighth Grade
6.N.1.1. (Comprehension) Represent fractions in equivalent forms and convert between fractions, decimals, and percents using halves, fourths, tenths, and hundredths.	7.N.1.1. (Comprehension) Represent numbers in a variety of forms by describing, ordering, and comparing integers, decimals, percents, and fractions.	8.N.1.1. (Comprehension) Represent numbers in a variety of forms and identify the subsets of rational numbers.
6.N.1.2. (Knowledge) Find factors and multiples of whole numbers.	7.N.1.2. (Application) Find and use common multiples and factors of whole numbers.	

Indicator 2: Apply operations within the set of real numbers.

Sixth Grade	Seventh Grade	Eighth Grade
6.N.2.1. (Comprehension) Add, subtract, multiply, and divide decimals.	7.N.2.1. (Application) Add, subtract, multiply, and divide integers and positive fractions.	8.N.2.1. (Application) Read, write, and compute within any subset of rational numbers.

Indicator 3: Develop conjectures, predictions, or estimations to solve problems and verify or justify the results.

Sixth Grade	Seventh Grade	Eighth Grade
6.N.3.1. (Application) Use various strategies to solve one- and two-step problems involving positive decimals.	7.N.3.1. (Application) Use various strategies to solve one- and two-step problems involving positive fractions and integers.	8.N.3.1. (Application) Use various strategies to solve multi-step problems involving rational numbers.

STATISTICS & PROBABILITY 6-8

Indicator 1: Use statistical models to gather, analyze, and display data to draw conclusions.

Sixth Grade	Seventh Grade	Eighth Grade
6.S.1.1. (Comprehension) Find the mean, mode, and range of an ordered set of positive data.	7.S.1.1. (Comprehension) Find the mean, median, mode, and range of a set of data.	8.S.1.1. (Comprehension) Find the mean, median, mode, and range of a data set from a stem-and-leaf plot and a line plot.
6.S.1.2. (Application) Display data using bar and line graphs and draw conclusions from data displayed in a graph.	7.S.1.2. (Application) Display data, using frequency tables, line plots, stem-and-leaf plots and make predictions from data displayed in a graph.	8.S.1.2. (Application) Use a variety of visual representations to display data to make comparisons and predictions.

Indicator 2: Apply the laws of probability to predict outcomes and solve problems.

Sixth Grade	Seventh Grade	Eighth Grade
6.S.2.1. (Knowledge) Find the probability of a simple event.	7.S.2.1. (Comprehension) Given a sample space, find the probability of a specific outcome.	8.S.2.1. (Comprehension) Find the sample space and compute probability for two simultaneous independent events.

SOUTH DAKOTA MATHEMATICS STANDARDS

9-12

At the high school level, the set of core standards and performance descriptors for each for the five content strands are presented first. These are followed by a separate set of advanced standards for each strand. Advanced standards are indicated by the letter “A” following the standard’s reference number (e.g., 9-12.A.2.1A meaning high school algebra indicator 2 standard 1 advanced). The advanced standards are followed by tables that summarize both the core and advance high school standards for each area.

All graduates of South Dakota schools are expected to achieve the core standards. **Advanced standards are not intended to apply to all high school students.** Advanced standards are intended to apply to students having achieved the core mathematics standards and are more advanced than first-year algebra and basic geometry. Not every student will choose to enroll in advanced mathematics curriculum; some students do not choose to take more than core mathematics requirements. Students who plan to attend post-secondary educational institutions should complete mathematics courses reflected in the advanced standards. Taking rigorous mathematics courses will be important to success in post-secondary educational studies.

Core High School Algebra
Grade Standards, Supporting Skills, and Examples

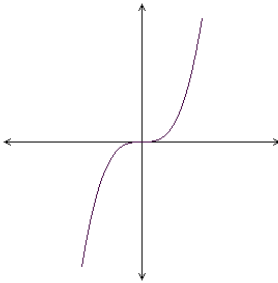
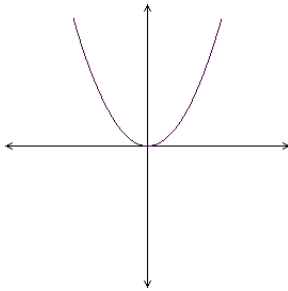
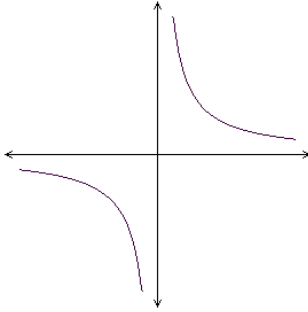
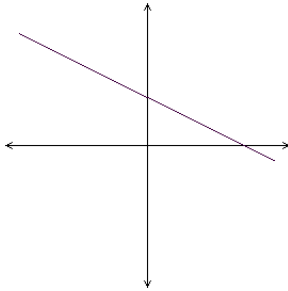
Indicator 1: Use procedures to transform algebraic expressions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>9-12.A.1.1. Students are able to write equivalent forms of algebraic expressions using properties of the set of real numbers.</p> <p>Example: Simplify $3(x + 5) - 2(7 - 2x)$</p> <p>Example: Express as the product of two binomials.</p> <p>1) $x^2 + 4x + 3$</p> <p>2) $x^2 - 9$</p> <ul style="list-style-type: none"> Evaluate algebraic expressions. Example: Evaluate $\frac{5x - y^2}{2z}$ when $x = 2$, $y = 3$, $z = 4$. Use laws of exponents. Example: Simplify $\frac{[(2x^2)^3 y^3 z^3]}{(4x^2 y^2 z)}$. Use conventional order of operations, including grouping and exponents. Example: Simplify $3x(x - 2)^2 + 5x^2$.

Indicator 2: Use a variety of algebraic concepts and methods to solve equations and inequalities.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>9-12.A.2.1. Students are able to use algebraic properties to transform multi-step, single-variable, first-degree equations.</p> <p>Example: Solve $-3(2x + 1) = 2(x - 1) + 3$</p>
(Application)	<p>9-12.A.2.2. Students are able to use algebraic properties to transform multi-step, single-variable, first-degree inequalities and represent solutions using a number line.</p> <p>Example: Solve and graph the solution $6 - 2(3 + 2x) < 4$.</p>

Indicator 3: Interpret and develop mathematical models.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>9-12.A.3.1. Students are able to create linear models to represent problem situations.</p> <p>Example: What equation would model total distance traveled over a period of time at a rate of 60 mph?</p> <ul style="list-style-type: none"> Calculate and interpret slope. <p>Example: A telephone bill is \$10 per month plus \$0.30 per minute for long distance calls. Write an equation in slope-intercept form ($y = mx + b$) that expresses the total amount of the phone bill.</p>
(Comprehension)	<p>9-12.A.3.2. Students are able to distinguish between linear and nonlinear models.</p> <p>Example: Distinguish between $d = 60t$ and $d = \frac{1}{2}gt^2$.</p> <p>Example: Which model represents a linear relationship?</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>a)</p>  </div> <div style="text-align: center;"> <p>b)</p>  </div> </div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>c)</p>  </div> <div style="text-align: center;"> <p>d)</p>  </div> </div>

Indicator 4: Describe and use properties and behaviors of relations, functions, and inverses.

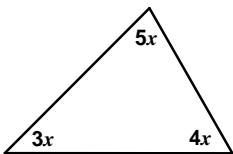
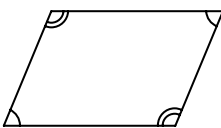
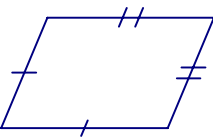
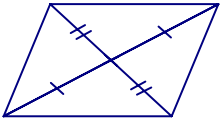
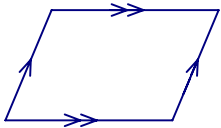
Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>9-12.A.4.1. Students are able to use graphs, tables, and equations to represent linear functions.</p> <p>Examples:</p> <ol style="list-style-type: none"> 1) Create a table from the graph or equation of a line. 2) Graph a linear equation in the form $y = mx + b$. 3) Write an equation of a line that passes through the points (3, 2) and (-1, 5).

**Core High School Algebra
Performance Descriptors**

Advanced	<p>High school students performing at the advanced level:</p> <ul style="list-style-type: none"> • transform algebraic expressions; • solve quadratic equations; • solve a system of linear equations.
Proficient	<p>High school students performing at the proficient level:</p> <ul style="list-style-type: none"> • transform polynomial expressions using real number properties; • solve single variable linear equations with integral coefficients; • graph linear equations; • interpret tables, graphs, and charts to solve problems; • create a linear model from a problem context.
Basic	<p>High school students performing at the basic level:</p> <ul style="list-style-type: none"> • transform linear expressions with integral coefficients using real number properties; • solve linear equations of the form $ax + b = c$, where a, b, and c are integers; • recognize the graph of a linear equation; • graph a line from a table of values.

Core High School Geometry
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use deductive and inductive reasoning to recognize and apply properties of geometric figures.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>9-12.G.1.1. Students are able to apply the properties of triangles and quadrilaterals to find unknown parts.</p> <p>Example: If the length of the hypotenuse of a 30°-60°-90° triangle is 10, what is the length of the shorter leg?</p> <p>Example: Consider the triangle with degree measures shown:</p> <div style="text-align: center;">  </div> <p>1) Find the value of x. 2) Find the measure of each angle.</p> <p>Example: Which of the following is not a parallelogram?</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>a)</p>  </div> <div style="text-align: center;"> <p>b)</p>  </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>c)</p>  </div> <div style="text-align: center;"> <p>d)</p>  </div> </div>

(Application)

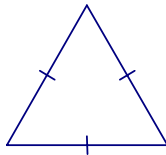
9-12.G.1.2. Students are able to identify and apply relationships among triangles.

Example: If the ratio of the sides of two similar triangles is 3 to 5, what is the ratio of their areas?

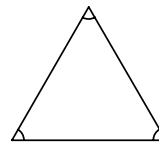
- Definitions and postulates

Example: Which of the following is not an isosceles triangle?

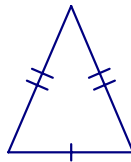
a)



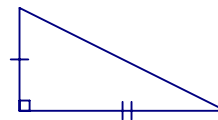
b)



c)

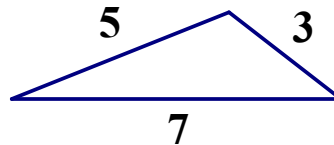


d)

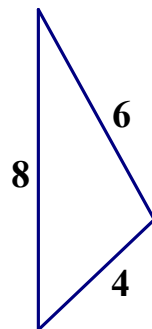


- Similarity theorems

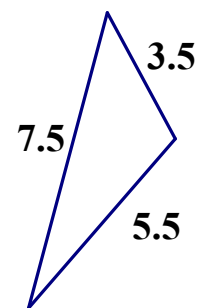
Example: Which triangle is similar to the one with sides 3, 5 and 7?



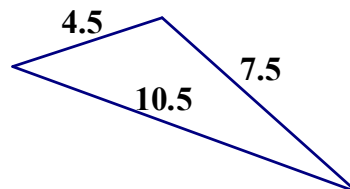
a)



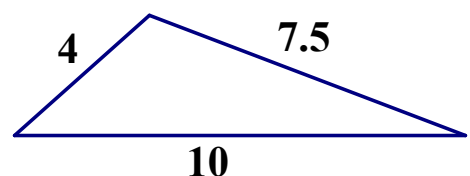
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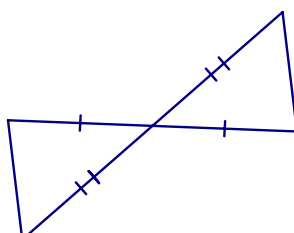


c)

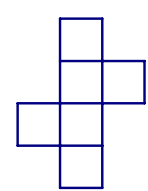
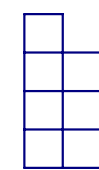
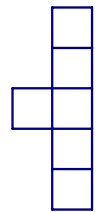
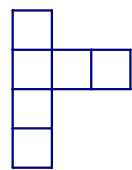
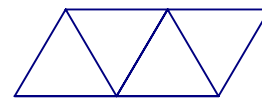
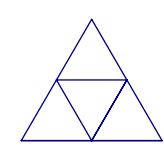
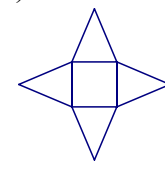
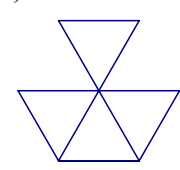


d)



	<ul style="list-style-type: none"> • Congruence theorems <p>Example: In the following figure, which triangle congruence theorem can be used to prove the two triangles congruent?</p>  <p>a) SSS b) SAS c) AAS d) ASA e) None of these</p>
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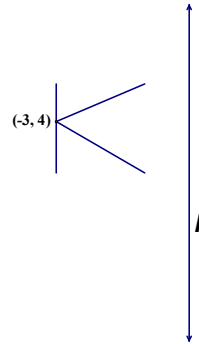
Indicator 2: Use properties of geometric figures to solve problems from a variety of perspectives.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Analysis)	<p>9-12.G.2.1. Students are able to recognize the relationship between a three-dimensional figure and its two-dimensional representation.</p> <p>Example: Which of the following will fold into a cube?</p> <p>a)  b)  c)  d) </p> <p>Example: Which of the following will not fold into a pyramid? (Note: All triangles in each net are congruent.)</p> <p>a)  b)  c)  d) </p> <ul style="list-style-type: none"> • Interpret floor plans • Follow instructions for assembly of a product, e.g., “some assembly required.”

9-12.G.2.2. Students are able to reflect across vertical or horizontal lines, and translate two-dimensional figures.

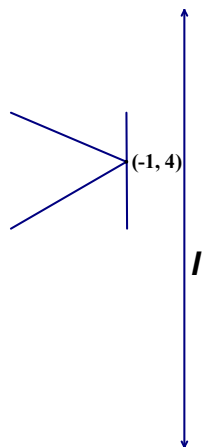
Example: Which of the following is the image if the letter K shown in the diagram below is reflected across line ***l***, then translated two units to the right?

Original figure:

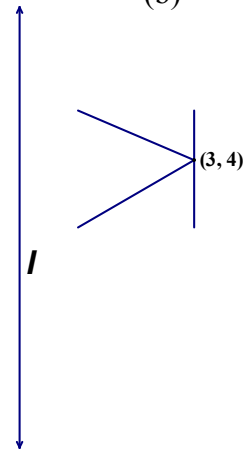


(Application)

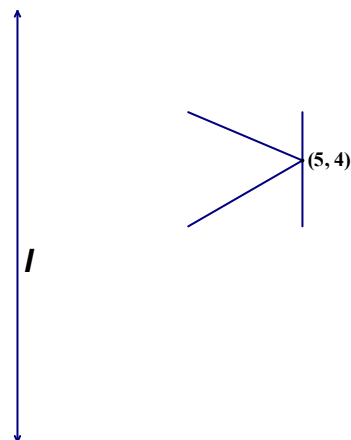
(a)



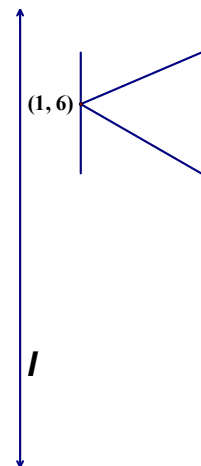
(b)


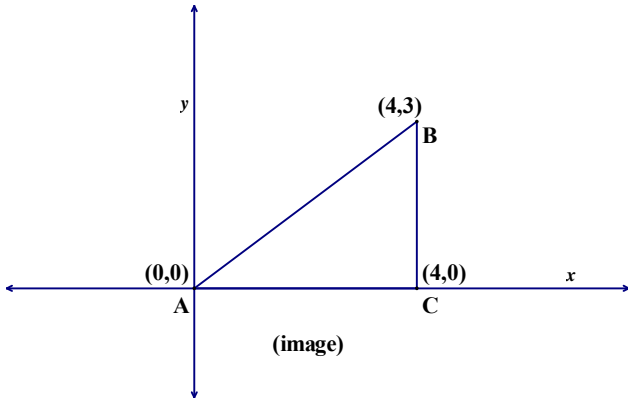
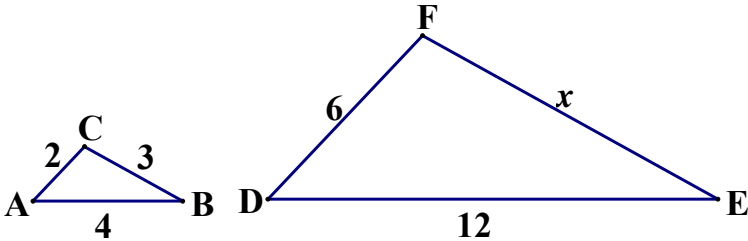


(c)



(d)



	<ul style="list-style-type: none"> Identify lines of symmetry. Example: How many lines of symmetry does this rectangle have?  a) 1 b) 2 c) 3 d) 4 Use the coordinate plane. Example: Triangle ABC is shown below. What transformation was performed if the pre-image of triangle ABC has coordinates of (0,0), (4,-3), and (4, 0)?  a) rotation about the origin b) reflection across the x-axis c) dilation by a factor of -1 d) reflection across the y-axis
(Application)	<p>9-12.G.2.3. Students are able to use proportions to solve problems.</p> <p>Example: Using the height and shadow length of a student and the length of a shadow of a building, find the building's height.</p> <p>Example: Given triangle ABC is similar to triangle DEF, what is the value of x?</p>  <p>a) 4 b) 9 c) 16 d) 12</p>

**Core High School Geometry
Performance Descriptors**

Advanced	High school students performing at the advanced level: <ul style="list-style-type: none">• translate and reflect a figure using the coordinate plane;• supply a missing reason and/or statement in a deductive proof.
Proficient	High school students performing at the proficient level: <ul style="list-style-type: none">• use deductive reasoning and known properties of a geometric figure to find other properties;• use proportions to solve problems;• translate or reflect a simple figure using the coordinate plane;• match a two-dimensional drawing to its three-dimensional counterpart.
Basic	High school students performing at the basic level: <ul style="list-style-type: none">• identify a translation or reflection;• solve a proportion.

**Core High School Measurement
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Apply measurement concepts in practical applications.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>9-12.M.1.1. Students are able to choose appropriate unit label, scale, and precision.</p> <p>Examples:</p> <ol style="list-style-type: none"> 1) Which would be the best unit of measure for the volume of a pitcher - cubic centimeters, cubic yards, or pounds? 2) The radius of a circle is 1.30 cm. Which is the most reasonable approximation for its circumference? a) 8.2 cm b) 8 cm c) 8.16814 cm d) 8.1610899 cm 3) In determining the area of a flower garden, an unreasonable answer is: a) 25.8 square feet b) 26 square feet c) 26.5 square feet d) 26.5278394 square feet <ul style="list-style-type: none"> • Determine appropriate scales for histograms, scatterplots, and other graphs.
(Comprehension)	<p>9-12.M.1.2. Students are able to use suitable units when describing rate of change.</p> <p>Examples:</p> <ol style="list-style-type: none"> 1) Find the average change in temperature in degrees per hour. 2) In 1903, there were 20,000 people in South Dakota. The population of South Dakota today is about 700,000. What units would describe the average rate of change in the population?
(Application)	<p>9-12.M.1.3. Students are able to use formulas to find perimeter, circumference, and area to solve problems involving common geometric figures.</p> <p>Examples:</p> <ol style="list-style-type: none"> 1) Find the radius of a circle that has an area of 100π square units. 2) Given points (3,1), (6,1), and (4,6), sketch the triangle and find its area. <ul style="list-style-type: none"> • Use algebraic expressions with geometric formulas.

	<p>Examples:</p> <ol style="list-style-type: none"> 1) Given the measures of a diagonal and one side of a rectangle, find the area of the rectangle. 2) Given the circumference of a circle, find the area. 3) The length of a rectangle is five units more than its width. The perimeter is 170 units. Find the dimensions.
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**Core High School Measurement
Performance Descriptors**

Advanced	<p>High school students performing at the advanced level:</p> <ul style="list-style-type: none"> • use dimensional analysis to solve problems; • apply indirect measurement methods; • represent and solve problems involving volume and surface area.
Proficient	<p>High school students performing at the proficient level:</p> <ul style="list-style-type: none"> • select a suitable unit of measure for problem situations, including rate of change; • choose an appropriate scale for a graph; • represent and solve problems involving perimeter, circumference, and area.
Basic	<p>High school students performing at the basic level:</p> <ul style="list-style-type: none"> • recognize a unit of measure that describes a rate of change problem; • find circumference and area of circles; • find perimeter and area of rectangles and triangles.

**Core High School Number Sense
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>9-12.N.1.1. Students are able to identify multiple representations of a real number.</p> <p>Example: Which of the following does not represent the same number?</p> <p>a) $\frac{4}{4}$ c) 3^0</p> <p>b) $6 - 5$ d) $\frac{0}{0}$</p> <ul style="list-style-type: none"> Given a real number identify the subset(s) of real numbers to which it belongs. <p>Example: Which of the following is an integer?</p> <p>a) $\frac{4}{7}$ b) $\frac{4}{10}$ c) $\frac{4}{2}$ d) $-\frac{4}{3}$</p> <p>Example: Which of the following is a rational number?</p> <p>a) $2\sqrt{2}$ b) π c) $\sqrt{4}$ d) $5.121221222 \dots$</p> <ul style="list-style-type: none"> Represent rational and irrational numbers in different forms. <p>Example: Write the decimal $0.757575\dots$ as a fraction in lowest terms.</p>

(Comprehension)	<p>9-12.N.1.2. Students are able to apply the concept of place value, magnitude, and relative magnitude of real numbers.</p> <p>Example: Put the following in order from largest to smallest: -3, 0.0032, $\frac{2}{3}$, $\sqrt{10}$, -5</p> <ul style="list-style-type: none"> Scientific notation Example: Which is larger: 2.3×10^6 or 3.2×10^5? Infinitely many solutions Examples: 1) $x > 4$ has infinitely many real solutions 2) $x + 2 = y$ has infinitely many ordered pair solutions Completeness of the real numbers (density, i.e. between any two real numbers is another real number) Example: Find two real numbers between $\frac{1}{3}$ and $\frac{1}{4}$.
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Indicator 2: Apply number operations with real numbers and other number systems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>9-12.N.2.1. Students are able to add, subtract, multiply, and divide real numbers including integral exponents.</p> <p>Examples: Expand each of the following as a rational number in lowest terms.</p> <p>1) $\left(\frac{2^{-1} + 2}{4}\right)$</p> <p>2) $\left(\frac{2}{3}\right)^2 + 3$</p>

Indicator 3: Develop conjectures, predictions, or estimations to solve problems and verify or justify the results.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Analysis)	<p>9-12.N.3.1. Students are able to use estimation strategies in problem situations to predict results and to check the reasonableness of results.</p> <p>Examples:</p> <ol style="list-style-type: none"> 1) When traveling at 72 miles per hour, is it possible to travel 350 miles in 2 hours? 2) At a salary of \$210 per month, is the annual income about \$24,000? <ul style="list-style-type: none"> • Use rounding as an estimation strategy. <p>Examples:</p> <ol style="list-style-type: none"> 1) Given the diameter of a circle is 9.8 inches, estimate its circumference. 2) The cost of shelving is 7 cents per inch. Estimate the cost of 48 inches of shelving. 3) The length of a rectangle is 4.25 cm and the width is 2.95 cm. Approximately what is the perimeter? <ul style="list-style-type: none"> • Use non-routine estimation strategies. <p>Examples:</p> <ol style="list-style-type: none"> 1) Approximately how many cubic centimeters are in a gallon of milk? (Students might solve this by guessing how many cubic centimeter cubes would fill the jug or by estimating the cubic centimeters in a quart.) 2) Approximate the area of an irregular shape drawn on a grid by counting the squares. 3) Explain how to find the surface area of your hand.

(Comprehension)	<p>9-12.N.3.2. Students are able to select alternative computational strategies and explain the chosen strategy.</p> <p>Example: Using mental math, which two numbers should be added first? $250 + 613 + 750$</p> <ul style="list-style-type: none"> • Use properties of numbers that allow operational shortcuts for computational procedures. <p>Examples:</p> <p>1) $103(17) = 100(17) + 3(17)$</p> <p>2) Rearrange and group to add the following: $-7 + 4 + 8 + (-2) + (-12) + 5 + 2$</p>
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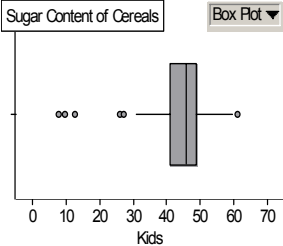
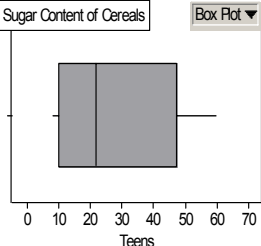
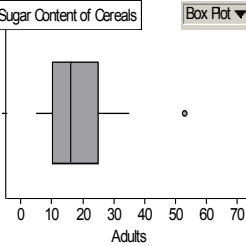
**Core High School Number Sense
Performance Descriptors**

Advanced	<p>High school students performing at the advanced level:</p> <ul style="list-style-type: none"> • classify a number as real, pure imaginary, or complex; • evaluate numerical expressions using rational exponents; • explain a reasonable solution to a problem.
Proficient	<p>High school students performing at the proficient level:</p> <ul style="list-style-type: none"> • identify the subsets of the set of real numbers to which a given number belongs; • evaluate numerical expressions using integral exponents; • check reasonableness of a solution to a problem.
Basic	<p>High school students performing at the basic level:</p> <ul style="list-style-type: none"> • give an example of each of the following: a whole number, an integer, and a rational number; • evaluate numerical expressions using whole number exponents.

**Core High School Statistics & Probability
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Use statistical models to gather, analyze, and display data to draw conclusions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Analysis)	<p>9-12.S.1.1. Students are able to draw conclusions from a set of data.</p> <p>Example: Stacy scored 0, 0, 3, 6, 12, 8, 17, 19, 17, 20, and 36 points in eleven games during the basketball season.</p> <ul style="list-style-type: none"> a) Is there an outlier in the data set? b) Give the five number summary. c) Is it possible to determine Stacy's shooting percentage? d) Can you determine that Stacy's performance improved? e) Predict how many points Stacy will score in the next game. <ul style="list-style-type: none"> • Determine and use appropriate statistical values. • Determine which questions can or cannot be answered from a given data set.
(Comprehension)	<p>9-12.S.1.2. Students are able to compare multiple one-variable data sets, using range, interquartile range, mean, mode, and median.</p> <p>Example: Kim scored 1, 0, 3, 6, 12, 8, 17, 17, 17, 17, and 35 points in eleven games during the basketball season. Pat scored 9, 11, 10, 13, 12, 11, 14, 12, 13, and 15 points in ten games during the basketball season. Who is the more consistent scorer? Why?</p>
(Analysis)	<p>9-12.S.1.3. Represent a set of data in a variety of graphical forms and draw conclusions.</p> <p>Example: In order to determine the median of a set of data, would you prefer to see a box-and-whisker plot or a histogram? Why?</p> <ul style="list-style-type: none"> • Make a scatterplot to draw a regression line and make predictions. <p>Example: As a group activity, students will plot their wrist measurement and shoe size as ordered pairs. After drawing the line of best fit, students will predict another person's wrist size based on a given shoe size.</p>

	<ul style="list-style-type: none"> Make a box-and-whisker plot to model a set of one-variable data. <p>Example: These box plots show the amount of sugar in cereals preferred by “kids” (ages 12 or younger), “teens” (ages 13 – 19) and “adults” (ages over 19).</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;">    </div> <ol style="list-style-type: none"> In general, which group prefers cereal with less sugar? Use the graphs and summary numbers to explain. For which group do more of those surveyed prefer cereals with similar sugar content? How did you decide this? <ul style="list-style-type: none"> Make a histogram from a frequency distribution.
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Indicator 2: Apply the concepts of probability to predict events/outcomes and solve problems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Knowledge)	<p>9-12.S.2.1. Students are able to distinguish between experimental and theoretical probability.</p> <p>Example: Determine which of the two activities represents experimental probability: a) roll two dice many times, record the sums, and write the probabilities of different sums, or b) create a sample space of all possible outcomes and write the probabilities of different sums.</p>
(Comprehension)	<p>9-12.S.2.2. Students are able to predict outcomes of simple events using given theoretical probabilities.</p> <p>Example: Given a spinner with unequal regions (50% red, 20% blue, 30% yellow), predict how many of the next 10 spins will be blue.</p> <ul style="list-style-type: none"> Determine the sample space of an experiment.

**Core High School Statistics & Probability
Performance Descriptors**

Advanced	High school students performing at the advanced level: <ul style="list-style-type: none"> • calculate probability of compound events; • determine correlation coefficient in a data set.
Proficient	High school students performing at the proficient level: <ul style="list-style-type: none"> • calculate probability of a simple event and make predictions; • answer questions about measures of central tendency and five-number summary based on a given data set; • draw a regression line for a scatterplot.
Basic	High school students performing at the basic level: <ul style="list-style-type: none"> • calculate the probability of a simple event; • calculate mean, median, and mode for a data set.

Advanced High School Algebra
Grade Standards, Supporting Skills, and Examples

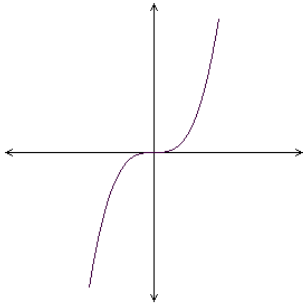
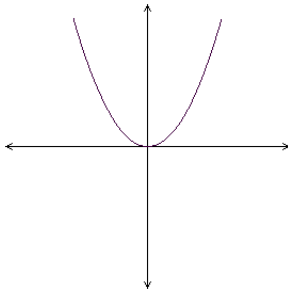
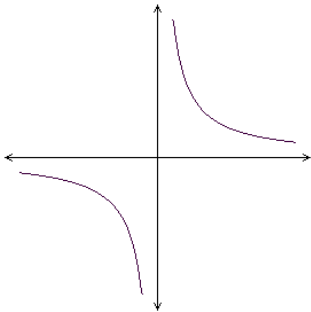
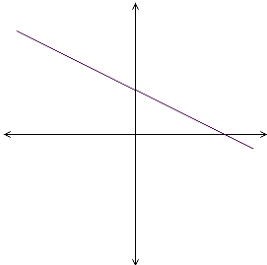
Indicator 1: Use procedures to transform algebraic expressions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>9-12.A.1.1A. Students are able to write equivalent forms of rational algebraic expressions using properties of real numbers.</p> <p>Example: Perform the indicated operation.</p> <p>1) $\frac{x-2}{x^2-4}$</p> <p>2) $\frac{x^2+5x+6}{2-x}$</p> <p>3) $\frac{2+\frac{1}{x}}{\frac{1}{x+3}-1}$</p>
(Application)	<p>9-12.A.1.2A. Students are able to extend the use of real number properties to expressions involving complex numbers.</p> <p>Example: Find the sum, difference, product, and quotient of $2+3i$ and $2-3i$.</p>

Indicator 2: Use a variety of algebraic concepts and methods to solve equations and inequalities.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Analysis)	<p>9-12.A.2.1A. Students are able to determine solutions of quadratic equations.</p> <ul style="list-style-type: none"> • Use the quadratic formula. Example: Solve $x^2 + 3x + 5 = 0$ • Use the discriminant, $b^2 - 4ac$, to describe the nature of the roots. Example: 1) Describe the nature of the roots a quadratic equation with a discriminant of -4. 2) Describe the nature of the roots of the equation $9x^2 - 13x + 5 = 0$
(Application)	<p>9-12.A.2.2A. Students are able to determine the solution of systems of equations and systems of inequalities.</p> <p>Examples: Solve each system.</p> <ol style="list-style-type: none"> 1) $2x + 5y = 9$ and $3x - 4y = 3$ 2) $x^2 + y^2 = 25$ and $3x^2 + 4y^2 = 84$ 3) $y < 2x + 3$ and $y > -4x - 7$
(Application)	<p>9-12.A.2.3A. Students are able to determine solutions to absolute value statements.</p> <p>Example: Solve $3x + 4 > 5$</p>

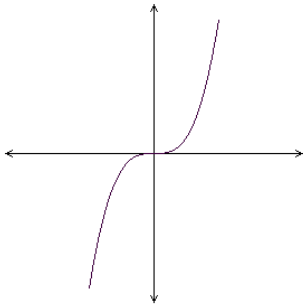
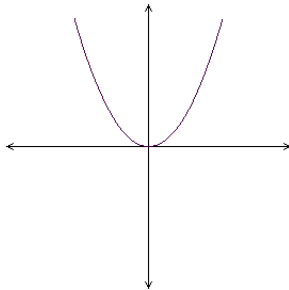
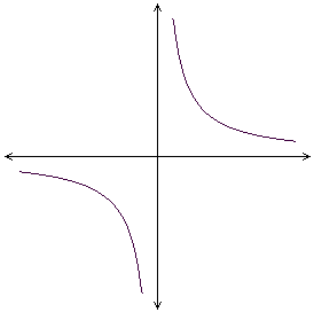
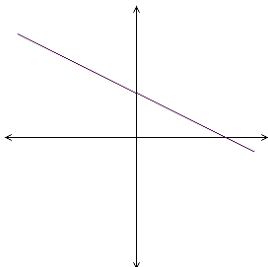
Indicator 3: Interpret and develop mathematical models.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Analysis)	<p>9-12.A.3.1A. Students are able to distinguish between linear, quadratic, inverse variation, and exponential models.</p> <p>Examples:</p> <p>1) Describe the difference between $y = 2x$, $y = x^2$, $y = \frac{2}{x}$ and $y = x^2$</p> <p>2) Which of the following graphs represents inverse variation?</p> <p>a) b)</p> <p>Illustrations for Example 9-12.A.3.2</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>a)</p>  </div> <div style="text-align: center;"> <p>b)</p>  </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>c)</p>  </div> <div style="text-align: center;"> <p>d)</p>  </div> </div>

(Synthesis)	<p>9-12.A.3.2A. Students are able to create formulas to model relationships that are algebraic, geometric, trigonometric, and exponential.</p> <p>Examples:</p> <p>1) Algebraic: $P(x) = I(x) - C(x)$</p> <p>2) Geometric: $A = s^2$</p> <p>3) Trigonometric: $y = A \sin B(x - C) + D$</p> <p>4) Exponential: $A(t) = A_0(1 + \frac{r}{n})^n$</p>
(Analysis)	<p>9-12.A.3.3A. Students are able to use sequences and series to model relationships.</p> <p>Example: A ball is dropped from a height of six feet. Each rebound is half the height of the previous bounce. What is the total vertical distance the ball has traveled on the tenth bounce?</p>

Indicator 4: Describe and use properties and behaviors of relations, functions, and inverses.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Analysis)	<p>9-12.A.4.1A. Students are able to determine the domain, range, and intercepts of a function.</p> <p>Example: Given the function $f(x) = \frac{(x-2)}{x}$, determine each of the following:</p> <p>1) domain of f</p> <p>2) range of f</p> <p>3) x - intercept</p> <p>4) y -intercept</p> <p>5) vertical and horizontal asymptotes</p>

<p>(Analysis)</p>	<p>9-12.A.4.2A. Students are able to describe the behavior of a polynomial, given the leading coefficient, roots, and degree.</p> <p>Example: Given a third degree polynomial with a double root at $x = -2$, a root at $x = 3$, and a positive coefficient on the term of highest degree, describe and sketch the graph.</p> <p>Example: Which of the following depicts the graph of $y = x^3$?</p> <div><div data-bbox="540 569 565 600">a)</div><div data-bbox="565 617 865 919"></div><div data-bbox="1019 569 1044 600">b)</div><div data-bbox="1127 632 1414 919"></div><div data-bbox="540 978 565 1010">c)</div><div data-bbox="557 1024 865 1331"></div><div data-bbox="1114 978 1138 1010">d)</div><div data-bbox="1127 1066 1393 1331"></div></div>
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9-12.A.4.3A. Students are able to apply transformations to graphs and describe the results.

- Change coefficients and/or constants.

1) Compare the graphs of $f(x) = x^2$ and $g(x) = 2(x+1)^2 + 3$

2) The graph of $y = f(x)$ is shown below.

“Which of the graph below is the graph of $y = 3[f(x)]$?

a)

b)

c)

d)

- Graph the inverse of a function.

Examples:

1) Show the reflection of the graph of $y = 2x + 3$ across the line $y = x$.

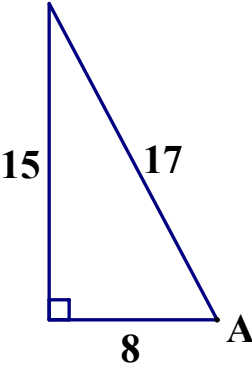
2) Graph the inverse of the function $y = x^2$.

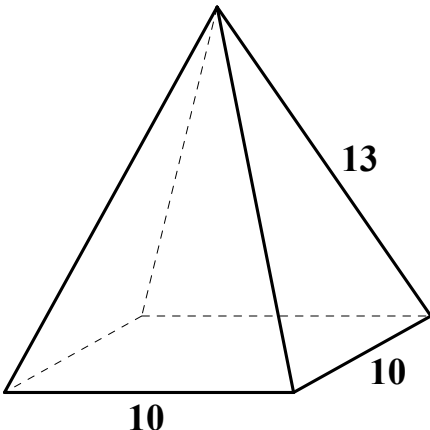
(Analysis)

(Application)	<p>9-12.A.4.4A. Students are able to apply properties and definitions of trigonometric, exponential, and logarithmic expressions.</p> <p>Examples:</p> <ol style="list-style-type: none"> 1) Simplify $\frac{1 - \cos^2 x}{\tan^2 x}$ 2) Evaluate $\log_4\left(\frac{1}{8}\right)$ 3) Evaluate $e^{\ln(e)}$ 4) Prove the identity: $(\sin x - \cos x)^2 = 1 - \sin(2x)$ 5) Solve for x: $\log_2(5x - 1) + 4 = \log_2 x$
(Analysis)	<p>9-12.A.4.5A. Students are able to describe characteristics of nonlinear functions and relations.</p> <ul style="list-style-type: none"> • Conic sections Example: Find the vertices, foci, length of major and minor axes and eccentricity of the graph of the ellipse having the equation $\frac{x^2}{9} + \frac{y^2}{25} = 1$. • Trigonometric functions Example: Find the period, amplitude, vertical and horizontal shift of $y = 3 \sin 2\left(x + \frac{\pi}{3}\right) - 2$. • Exponential and logarithmic functions Examples: 1) Write $y = 3^{2x}$ in logarithmic form. 2) Determine the domain and range of $y = 3^{2x}$ and $y = \ln(5x + 1)$.
(Application)	<p>9-12.A.4.6A. Students are able to graph solutions to linear inequalities.</p> <p>Example: Graph the solution of $y < 2x - 4$</p>

**Advanced High School Geometry
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Use deductive and inductive reasoning to recognize and apply properties of geometric figures.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Evaluation)	<p>9-12.G.1.1A. Students are able to justify properties of geometric figures.</p> <p>Example:</p> <ul style="list-style-type: none"> • Write a direct proof. • Make conjectures.
(Application)	<p>9-12.G.1.2A. Students are able to determine the values of the sine, cosine, and tangent ratios of right triangles.</p> <p>Example: Determine the sine, cosine, and tangent of angle A.</p> 
(Application)	<p>9-12.G.1.3A. Students are able to apply properties associated with circles.</p> <p>Example: Find measures of angles, arcs, chords, tangents, segments and secant segments.</p>

(Analysis)	<p>9-12.G.1.4A. Students are able to use formulas for surface area and volume to solve problems involving three-dimensional figures.</p> <p>Example: Find the total surface area and volume of the regular square pyramid shown.</p> 
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Indicator 2: Use properties of geometric figures to solve problems from a variety of perspectives.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Synthesis)	<p>9-12.G.2.1A. Students are able to use Cartesian coordinates to verify geometric properties.</p> <p>Example: Prove that $\triangle ABC$ is a right triangle, given $A(0,0)$, $B(-2,6)$, and $C(3,1)$.</p>

**Advanced High School Measurement
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Apply measurement concepts in practical applications.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	9-12.M.1.1A. Students are able to use dimensional analysis to check answers and determine units of a problem solution. Example: An interplanetary probe travels 30,400 miles/hour. Express this as meters/second.
(Analysis)	9-12.M.1.2A. Students are able to use indirect measurement in problem situations that defy direct measurement. Example: An electronic measuring device on the ground 320 feet from the base of the dam at Lake Pactola determines the distance to the top to be 400 feet. How high is the dam?

**Advanced High School Number Sense
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p>9-12.N.1.1A. Students are able to describe the relationship of the real number system to the complex number system.</p> <p>Example:</p> <ol style="list-style-type: none"> 1) Identify the imaginary part of $5 + 4i$. 2) What is the magnitude of $2 + 3i$?
(Application)	<p>9-12.N.1.2A. Students are able to apply properties and axioms of the real number system to various subsets, e.g., axioms of order, closure.</p> <p>Examples:</p> <ol style="list-style-type: none"> 1) Is the set $\{1, 2, 3\}$ closed under addition? 2) Which of these operations are commutative? <ol style="list-style-type: none"> a) addition b) subtraction c) multiplication d) division

Indicator 2: Apply number operations with real numbers and other number systems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p>9-12.N.2.1A. Students are able to add, subtract, multiply, and divide real numbers including rational exponents.</p> <p>Examples: Express as a rational number in lowest terms:</p> <p>1) $\left(8^{\frac{2}{3}} - 8^{\frac{1}{3}}\right)^3$</p> <p>2) $\frac{(2^{-3} + 2^2)^{-1}}{2^{-1}}$</p> <ul style="list-style-type: none"> Simplify numeric expressions with radicals. Example: <p>1) Perform the indicated operation: $\sqrt{\frac{27}{5}} - \sqrt{\frac{3}{5}}$</p> <p>2) Is $\frac{4}{1 + \sqrt{5}}$ equivalent to $-1 + \sqrt{5}$?</p>

Indicator 3: Develop conjectures, predictions, or estimations to solve problems and verify or justify the results.

Note: Skills for this indicator have been subsumed within applications to advanced skills by the time students reach advanced high school mathematics.

**Advanced High School Statistics & Probability
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Use statistical models to gather, analyze, and display data to draw conclusions.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Evaluation)	<p>9-12.S.1.1A. Students are able to analyze and evaluate the design of surveys and experiments.</p> <p>Examples:</p> <ol style="list-style-type: none"> 1) Create and administer a survey and identify sources of bias. 2) What type(s) of bias might affect the results of a telephone survey? 3) In an experiment, why is it very important to randomly assign subjects to groups?
(Evaluation)	<p>9-12.S.1.2A. Students are able to analyze and evaluate graphical displays of data.</p> <p>Example: Find graphical displays of data in a newspaper or magazine and discuss the following:</p> <ol style="list-style-type: none"> a) What is the type of data display? b) Is the display a good model for the data? c) What other type of data display(s) could have been used? d) Does the display exhibit any distortions which could be misleading?
(Analysis)	<p>9-12.S.1.3A. Students are able to compare multiple one-variable data sets, using standard deviation and variance.</p> <p>Example: In her math class, Jane scored 87 on a math test with mean score 80 and standard deviation 5. In another class, Alice scored 85 on a test with mean score 83 and standard deviation 3. Which student has the better score in her class?</p> <ul style="list-style-type: none"> • Calculate the standard deviation and variance of a data set.
(Application)	<p>9-12.S.1.4A. Students are able to describe the normal curve and use it to make predictions.</p> <p>Example: A set of normally distributed data representing the heights of a population of 18-year-old females has mean 65 inches, with standard deviation 2 inches. In a group of one hundred 18-year-old females from this population, approximate the number who are taller than 67 inches.</p>

(Application)	<p>9-12.S.1.5A. Students are able to use scatterplots, best-fit lines, and correlation coefficients to model data and support conclusions.</p> <p>Example: For a given set of two-variable data:</p> <ol style="list-style-type: none"> 1) Create a scatterplot and find the least-squares regression line. 2) Interpret the value of the correlation coefficient.
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Indicator 2: Apply the concepts of probability to predict events/outcomes and solve problems.

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples												
(Application)	<p>9-12.S.2.1A. Students are able to use probabilities to solve problems.</p> <ul style="list-style-type: none">• Compute combinations, permutations.• Interpret tables. <p>Example: Use the data given in the table:</p> <table><tr><th colspan="3">Voters in District 5</th></tr><tr><th></th><th>Males</th><th>Females</th></tr><tr><th>Democrat</th><td>30</td><td>50</td></tr><tr><th>Republican</th><td>70</td><td>50</td></tr></table> <ol style="list-style-type: none">1) Find the probability that a voter in District 5 is a male Democrat.2) Given that a voter is a Democrat, find the probability that the voter is female. <ul style="list-style-type: none">• Create and use tree diagrams.	Voters in District 5				Males	Females	Democrat	30	50	Republican	70	50
Voters in District 5													
	Males	Females											
Democrat	30	50											
Republican	70	50											
(Application)	<p>9-12.S.2.2A. Students are able to determine probability of compound, complementary, independent, and mutually exclusive events.</p> <p>Examples: Solve the following:</p> <ol style="list-style-type: none">1) Using a standard deck of cards of 52 cards, find the probability of drawing a king followed by another king, without replacing the first king back into the deck.2) Using a standard deck of cards of 52 cards, find the probability of drawing a king followed by another king, with replacing the first king back into the deck.3) Which of these problem situations represents independent events?												

	<p>Examples: Solve the following:</p> <ol style="list-style-type: none"> 1) Find the probability of drawing an ace in a single draw from a standard deck of 52 cards. 2) Find the probability of drawing a heart in a single draw from a standard deck of 52 cards. 3) Find the probability of drawing the ace of hearts in a single draw from a standard deck of 52 cards. 4) Find the probability of drawing an ace or a heart in a single draw from a standard deck of 52 cards. 5) Explain whether the events “drawing an ace” and “drawing a heart” are mutually exclusive (disjoint)? 6) Describe the complementary event of “drawing a heart.”
(Analysis)	<p>9-12.S.2.3A. Students are able to generate data and use the data to determine empirical (experimental) probabilities.</p> <p>Example: Toss 20 identical thumbtacks once and record the number that land with the point up. Do this 50 times, recording each result. Use the data to approximate the probability of this type of thumbtack landing point up.</p>

High School Algebra
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use procedures to transform algebraic expressions.

Core HS Standards
9-12.A.1.1. (Comprehension) Write equivalent forms of algebraic expressions using properties of the set of real numbers.
Advanced HS Standards
9-12.A.1.1A. (Application) Write equivalent forms of rational algebraic expressions using properties of real numbers.
9-12.A.1.2A. (Application) Extend the use of real number properties to expressions involving complex numbers.

Indicator 2: Use a variety of algebraic concepts and methods to solve equations and inequalities.

Core HS Standards
9-12.A.2.1. (Comprehension) Use algebraic properties to transform multi-step, single variable, and first-degree equations.
9-12.A.2.2. (Application) Use algebraic properties to transform multi-step, single variable, and first-degree inequalities and represent solutions using a number line.
Advanced HS Standards
9-12.A.2.1A. (Analysis) Determine solutions of quadratic equations.
9-12.A.2.2A. (Application) Determine the solution of systems of equations and systems of inequalities.
9-12.A.2.3A. (Application) Determine solutions to absolute value statements.

Indicator 3: Interpret and develop mathematical models.

Core HS Standards
9-12.A.3.1. (Application) Create linear models to represent problem situations.
9-12.A.3.2. (Comprehension) Distinguish between linear and nonlinear models.
Advanced HS Standards
9-12.A.3.1A. (Analysis) Distinguish between linear, quadratic, inverse variations, and exponential models.
9-12.A.3.2A. (Synthesis) Create formulas to model relationships that are algebraic, geometric, trigonometric, and exponential.
9-12.A.3.3A. (Analysis) Use sequences and series to model relationships.

Indicator 4: Describe and use properties and behaviors of relations, functions, and inverses.

Core HS Standards
9-12.A.4.1. (Application) Use graphs, tables, and equations to represent linear functions.
Advanced HS Standards
9-12.A.4.1A. (Analysis) Determine the domain, range, and intercepts of a function.
9-12.A.4.2A. (Analysis) Describe the behavior of a polynomial, given the leading coefficient, roots, and degree.
9-12.A.4.3A. (Analysis) Apply transformations to graphs and describe the results.
9-12.A.4.4A. (Application) Apply properties and definitions of trigonometric, exponential, and logarithmic expressions.
9-12.A.4.5A. (Analysis) Describe characteristics of nonlinear functions and relations.
9-12.A.4.6A. (Application) Graph solutions to linear inequalities.

High School Geometry
Grade Standards, Supporting Skills, and Examples

Indicator 1: Use deductive and inductive reasoning to recognize and apply properties of geometric figures.

Core HS Standards
9-12.G.1.1. (Application) Apply the properties of triangles and quadrilaterals to find unknown parts.
9-12.G.1.2. (Application) Identify and apply relationships among triangles.
Advanced HS Standards
9-12.G.1.1A. (Evaluation) Justify properties of geometric figures.
9-12.G.1.2A. (Application) Determine the values of the sine, cosine, and tangent ratios of right triangles.
9-12.G.1.3A. (Application) Apply properties associated with circles.
9-12.G.1.4A. (Analysis) Use formulas for surface area and volume to solve problems involving three-dimensional figures.

Indicator 2: Use properties of geometric figures to solve problems from a variety of perspectives.

Core HS Standards
9-12.G.2.1. (Analysis) Recognize the relationship between a three-dimensional figure and its two-dimensional representation.
9-12.G.2.2. (Application) Reflect across vertical or horizontal lines, and translate two-dimensional figures.
9-12.G.2.3. (Application) Use proportions to solve problems.
Advanced HS Standards
9-12.G.2.1A. (Synthesis) Use Cartesian coordinates to verify geometric properties.

**High School Measurement
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Apply measurement concepts in practical applications.

Core HS Standards
9-12.M.1.1. (Comprehension) Choose appropriate unit label, scale, and precision.
9-12.M.1.2. (Comprehension) Use suitable units when describing rate of change.
9-12.M.1.3. (Application) Use formulas to find perimeter, circumference, and area to solve problems involving common geometric figures.
Advanced HS Standards
9-12.M.1.1A. (Application) Use dimensional analysis to check answers and determine units of a problem solution.
9-12.M.1.2A. (Analysis) Use indirect measurement in problem situations that defy direct measurement.

**High School Number Sense
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers.

Core HS Standards
9-12.N.1.1. (Comprehension) Identify multiple representations of a real number.
9-12.N.1.2. (Comprehension) Apply the concept of place value, magnitude, and relative magnitude of real numbers.
Advanced HS Standards
9-12.N.1.1A. (Comprehension) Describe the relationship of the real number system to the complex number system.
9-12.N.1.2A. (Application) Apply properties and axioms of the real number system to various subsets, e.g., axioms of order, closure.

Indicator 2: Apply operations within the set of real numbers.

Core HS Standards
9-12.N.2.1. (Comprehension) Add, subtract, multiply, and divide real numbers including integral exponents.
Advanced HS Standards
9-12.N.2.1A. (Application) Add, subtract, multiply, and divide real numbers including rational exponents.

Indicator 3: Develop conjectures, predictions, or estimations to solve problems and verify or justify the results.

Core HS Standards
9-12.N.3.1. (Analysis) Use estimation strategies in problem situations to predict results and to check the reasonableness of results.
9-12.N.3.2. (Comprehension) Select alternative computational strategies and explain the chosen strategy.
Advanced HS Standards
<i>Note: Skills for this indicator have been subsumed within applications to advanced skills by the time students reach advanced high school mathematics.</i>

**High School Statistics & Probability
Grade Standards, Supporting Skills, and Examples**

Indicator 1: Use statistical models to gather, analyze, and display data to draw conclusions.

Core HS Standards
9-12.S.1.1. (Analysis) Draw conclusions from a set of data.
9-12.S.1.2. (Comprehension) Compare multiple one-variable data sets, using range, interquartile range, mean, mode, and median.
9-12.S.1.3. (Analysis) Represent a set of data in a variety of graphical forms and draw conclusions.
Advanced HS Standards
9-12.S.1.1A. (Evaluation) Analyze and evaluate the design of surveys and experiments.
9-12.S.1.2A. (Evaluation) Analyze and evaluate graphical displays of data.
9-12.S.1.3A. (Analysis) Compare multiple one-variable data sets, using standard deviation and variance.
9-12.S.1.4A. (Application) Describe the normal curve and use it to make predictions.
9-12.S.1. 5A. (Application) Use scatterplots, best-fit lines, and correlation coefficients to model data and support conclusions.

Indicator 2: Apply the concepts of probability to predict events/outcomes and solve problems.

Core HS Standards
9-12.S.2.1. (Knowledge) Distinguish between experimental and theoretical probability.
9-12.S.2.2. (Comprehension) Predict outcomes of simple events using given theoretical probabilities.
Advanced HS Standards
9-12.S.2.1A. (Application) Use probabilities to solve problems.
9-12.S.2.2A. (Application) Determine probability of compound, complementary, independent, and mutually exclusive events.
9-12.S.2.3A. (Analysis) Generate data and use the data to estimate empirical probabilities.

SOUTH DAKOTA MATHEMATICS STANDARDS GLOSSARY

*Note: This glossary contains explanations, not necessarily formal mathematical definitions of terms used in the standards document.

Absolute value A number's distance from zero on the number line. The absolute value of -4 is 4; the absolute value of 4 is 4; the symbol greater is $|4|$.

Acute angle An angle whose measure is more than 0° but less than 90° .

Algorithm An organized sequential procedure for performing a given type of calculation or solving a given type of problem. An example is long division.

Analog Having to do with data represented by continuous variables, e.g., a clock with hour, minute, and second hands.

Area The measure of a region of a plane, usually represented by the number of square units needed to cover a surface enclosed by a geometric figure.

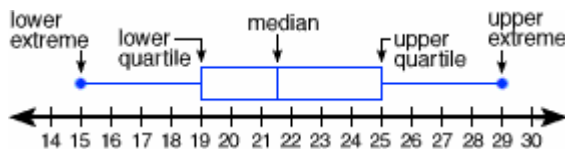
Arithmetic sequence A sequence of elements in which each term is the result of adding a fixed number to the previous term.

Associative property Allows numbers to be regrouped in an addition or multiplication problem, e.g., $a + (b + c) = (a + b) + c$; $ax(b \times c) = (a \times b) \times c$.

Axiom A basic assumption about a mathematical system from which theorems can be deduced. For example, the system could be the points and lines in the plane. Then an axiom would be that given any two distinct points in the plane, there is a unique line through them.

Bar graph A graph form using rectangular bars to summarize data; specifically to show how many observations fall into a particular category.

Box-and-whisker plot A graphical method for displaying the median, quartiles, and extremes of a set of data, using the number line.



Cartesian plane See coordinate plane.

Circle A set of all points in a plane that are the same distance from a given point in the plane.

Circumference Distance around a circle. The formula is $C = 2\pi r$, where r is the circle's radius, or $C = \pi d$, where d is the circle's diameter.

Closure property A set of numbers, such as the integers, is closed under a particular operation if performing the operation on numbers in the set results in another number in that set. For example, the set of non-zero integers is closed under multiplication, but is not closed under division.

Coefficient The numerical part of a term, e.g., 5 is the coefficient of the x^2 term in $5x^2 - 7$.

Combination A selection in which order is not considered.

Commutative property The property of a number system that provides for the reordering of terms in certain operations, such as addition and multiplication, e.g., $a + b = b + a$, $ab = ba$.

Compensation A mental math strategy in which one addend is changed to a multiple of 10 and then the other addend is adjusted to keep the balance, e.g.,

$16 + 9$	$7 + 9$
$(16 - 1) + (9 + 1)$	$(7 - 1) + (9 + 1)$
$15 + 10 = 25$	$6 + 9 = 16$

Complex number A number of the form $a + bi$ where a and b are real numbers and $i = \sqrt{-1}$.

Cone A three-dimensional shape in space that has a circular base and one vertex.

Congruent Geometric figures or angles that have the same size and shape. Two angles are congruent if they have the same measure. Two line segments are congruent if they have the same length. The symbol is \cong .

Conjecture An informed, educated guess.

Composite number A natural number greater than one that is not prime.

Conversion factor A numerical factor used to multiply or divide a quantity when converting from one system of units to another.

Coordinate plane A plane in which two number lines called coordinate axes intersect at right angles and are usually called the x -axis and y -axis. Every point in a coordinate plane can be described uniquely by an ordered pair of numbers, the coordinates of the point with respect to the coordinate axes.

Cosine The cosine of an angle (θ), $\cos(\theta)$ is the x -coordinate of the point on the unit circle so that the ray connecting the point with the origin makes an angle of θ with the positive x -axis. When θ is an angle of a right triangle, then $\cos(\theta)$ is the ratio of the adjacent side to the hypotenuse.

Counting number A number used for counting objects, i.e., a number from the set $\{1, 2, 3, 4, 5, \dots\}$. The same as natural numbers.

Decimal number A numeral that contains a decimal point, such as 2.673.

Deductive reasoning A type of reasoning in which the conclusion about particulars follows necessarily from general or universal premises.

Difference The result of a subtraction.

Digit Any of the symbols used to write numbers, 0-9. The ten symbols, 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. The number 215 has three digits: 2, 1, and 5.

Digital Having to do with data that is represented in the form of numerical digits; providing a readout in numerical digits, e.g., a digital watch.

Dilation A type of transformation that is a proportional shrinking or enlargement of a figure.

Dimensional analysis A method of manipulating unit measures algebraically to determine the proper units for a quantity computed algebraically. For example, velocity has units of the form distance over time (e.g., meters per second [m/sec]), and acceleration has units of velocity over time; so it follows that acceleration has units $(m/sec)/sec = m/(sec^2)$.

Distributive property A property of the number system in which multiplication distributes over addition represented by $a(b + c) = ab + ac$.

Domain The domain of a function is the set of possible values for x .

Elapsed time Difference between starting time and the ending time of an event.

Expanded form The expanded form of an algebraic expression is the equivalent expression without parentheses. For example, the expanded form of $(a + b)^2$ is $a^2 + 2ab + b^2$.

Expanded notation A way of representing a number that shows the sum of each digit multiplied by the appropriate positive power of ten and the units digit, e.g., 3451 as $3 \times 1000 + 4 \times 100 + 5 \times 10 + 1$ or as $3 \times 10^3 + 4 \times 10^2 + 5 \times 10 + 1$.

Exponent The number that indicates how many times the base is used as a factor, e.g., in $4^3 = 4 \times 4 \times 4 = 64$, the exponent is 3, indicating that 4 is repeated as a factor three times.

Exponential function A function commonly used to study growth and decay. It has the form $y = a^x$ with a positive value of a other than $a = 1$.

Factors Any of two or more quantities that are multiplied together, for example, 2 and 3 are factors of 6.

First degree expressions See linear expressions.

First degree equations An equation involving only first degree expressions.

Five number summary For a data set, the numbers representing the minimum and maximum values, first and third quartiles, and median.

Function A mathematical relation that associates each object in a set with exactly one value.

Fundamental counting principle If event M can occur in m ways, and after it has occurred, event N can occur in n ways, then event M followed by event N can occur $m \cdot n$ ways.

Geometric pattern A sequence of symbols or geometric figures.

Geometric sequence (progression) An ordered set of numbers that has a common ratio between consecutive terms, e.g., $\{1, 3, 9, 27, 81 \dots\}$.

Histogram A vertical block graph with no spaces between the blocks. It is used to summarize data by representing the frequency of observations that fall within uniform intervals of values.

Hypotenuse In a right triangle the hypotenuse is the longest side which is opposite the right angle.

Identity property Adding zero to a number does not change the value. Multiplying a number by one does not change the value.

Independent event Two events in which the occurrence of one event does not affect the probability of the occurrence of the other.

Inductive reasoning The type of reasoning that uses inference to reach a generalized conclusion from particular instances.

Inequality A relationship between two quantities involving one of the following relationships: less than, less than or equal to, greater than, greater than or equal to, or not equal.

Integer A number that is either a whole number or the negative of a whole number.

Integral Refers to an integer.

Intercepts The values where the graph of a relation crosses the axes.

Interquartile range The difference between the third and first quartiles.

Inverse of a function $f(x)$ is a function, $g(x)$ such that $f(g(x)) = x$ and $g(f(x)) = x$.

Inverse operations Subtraction is the inverse operation for addition. Division is the inverse operation for multiplication.

Irrational number A number that cannot be expressed as a quotient of two integers, e.g., $\sqrt{2}$. A number is irrational if and only if it cannot be written as a repeating or terminating decimal.

Landmark numbers Numbers that are familiar landing places that make for simple calculations and to which other numbers can be related such as 10, 100, and 1,000 and their multiples and factors.

Line graph A graph that connects data points.

Line of best fit A line drawn through, or near to, as many data points as possible on a scatterplot.

Line plot A number line with dots or other marks above it to show the number of times an event occurs.

Linear equation Any equation that can be written in the form $Ax + By + C = 0$ where A and B cannot both be 0. The graph of such an equation is a line.

Linear function A function of the form $f(x) = mx + b$ where m and b are some fixed numbers, representing slope and y -intercept. Functions of this kind are called “linear” because their graphs are lines.

Linear expression An expression of the form $ax + by + c$, $ax + by + cz + d$, where x , y , and z variable and a , b , c , and d are constants.

Linear pattern See arithmetic sequence.

Linear relationship A relationship involving only linear expressions.

Line of symmetry A line that divides a figure into two halves that are mirror images of each other.

Logarithm Another way to express an exponent. For example, since $10^2 = 100$ than $\log_{10} 100 = 2$.

Mean In statistics, the average obtained by dividing the sum of two or more quantities by the number of these values.

Measure of central tendency The mean, median, and mode of a set of data.

Median In statistics, the quantity designating the central value in a set of numbers. The center number (or the average of the two central numbers) of a list of data when the numbers are arranged in order from the least to greatest.

Mode In statistics, the value that occurs most frequently in a given set of numbers.

Monomial A product of numbers and/or variables, e.g., $5x^2$, $3x^2y$, $7x^3yz^2$.

Natural numbers The set of counting numbers.

Nested parentheses Grouping symbols within grouping symbols, $[10(3 + 2) - 12]$.

Net Two-dimensional pattern that can be folded to form a three-dimensional shape.

Nonstandard unit Unit of measurement expressed in terms of objects (such as paper clips, sticks of gum, shoes, etc.).

Numeral A symbol, not a variable, that is used to represent a number.

Numerical expressions An expression using only numerals.

Numeric pattern A pattern composed of numerals.

Obtuse angle An angle with a measurement greater than 90° and/or less than 180° .

Operational symbols Symbols used to indicate operations, such as $+$ for addition, etc.

Order of operations Rules that describe the sequence used in evaluating expressions; that is, parenthesis, exponents, multiplication and division, addition and subtraction.

Ordered pair A pair of numbers that gives the coordinates of a point on a coordinate plane in this order – (horizontal coordinate, vertical coordinate).

Ordinal number A number designating the place (as first, second, or third) occupied by an item in an ordered sequence.

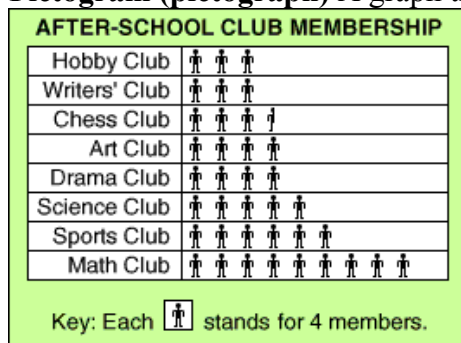
Parallel Given distinct lines in the plane that are infinite in both directions, the lines are parallel if they never meet.

Perimeter The distance around a plane, closed geometric figure.

Permutation A permutation is a specific reordering of a set of numbers $\{1, 2, \dots, n\}$.

Perpendicular lines Two lines that intersect at right angles.

Pictogram (pictograph) A graph that uses pictures to show and compare information.



Plane A flat surface that extends indefinitely in all directions.

Polynomial In algebra, a sum of monomials; for example, $x^2 + 2xy + y^2$.

Prime Number A natural number greater than one is prime if and only if the only positive integer factors are one and the number itself. The first seven primes are 2, 3, 5, 7, 11, 13 and 17.

Probability A number from zero to one that describes the likelihood that a given event will take place. For example, the probability of throwing a six with a single throw of one die is $1/6$.

Product The result of a multiplication.

Proof A method of constructing a valid argument, using deductive reasoning.

Proportion An equation that states that two ratios are equivalent, e.g., $\frac{4}{8} = \frac{1}{2}$ or $4:8 = 1:2$.

Pythagorean theorem For any right triangle, the sum of the squares of the measures of the legs equals the square of the measure of the hypotenuse, e.g., $a^2 + b^2 = c^2$ where a and b are the legs and c is the hypotenuse.

Quadrant One of the four regions into which the coordinate plane is divided.

Quadratic function A function containing x^2 , a polynomial of degree 2 such as $f(x) = ax^2 + bx + c$.

Quartile The value of the boundary at the 25th, 50th, or 75th percentiles of a frequency distribution divided into four parts, each containing a quarter of the population.

Quotient The result of a division.

Random sample A group of people or objects chosen from a larger group or population by a process giving equal chance of selection to all possible people or objects.

Range In statistics, the difference between the greatest and smallest values in a data set.

Range of a function The set of possible values for y or $f(x)$.

Rate A ratio that compares two quantities measured in different units.

Ratio A quotient of two numbers or like quantities, e.g., 4 to 7 or $4 : 7$ or $\frac{4}{7}$.

Rational number A number that can be written as the ratio of two integers, e.g., 0.5 , $\frac{3}{5}$, -3 , 8 , $3\frac{9}{10}$.

Real number The set of numbers consisting of all rational and all irrational numbers.

Reflection A type of transformation that creates a mirror image of a figure on the opposite side of a line, called the line of symmetry.

Relation An equation that expresses the relationship between two variables.

Right angle An angle with a measurement of 90° .

Root A number that can be used as a factor a given number of times to produce the original number; for example, the fifth root of $32 = 2$ because $2^5 = 32$.

Root of an equation A value that makes the equation true.

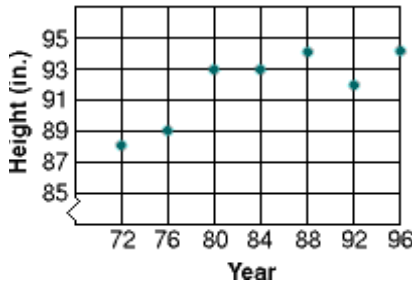
Rotation A type of transformation that turns a figure about a fixed point, called the center of rotation.

Sample space In probability, the set of all possible outcomes of a given experiment, e.g., the sample space for tossing two coins is $\{(H,H), (H,T), (T,H), (T,T)\}$.

Scalene triangle A triangle with three unequal sides.

Scatterplot Two sets of data plotted as ordered pairs in the coordinate plane.

Winning Olympic High Jump



Scientific notation A system in which numbers are expressed as products consisting of a number from one to ten multiplied by an appropriate power of ten, e.g., $562 = 5.62 \times 10^2$.

Sequence A set of elements that can be counted, e.g., 1, 3, 9, 27, 81. In this sequence, 1 is the first term, 3 is the second term, 9 is the third term, and so on.

Similarity Having the same shape but not necessarily the same size.

Sine The sine of an angle θ ($\sin \theta$) is the y-coordinate of the point on the unit circle so that the ray connecting the origin to the point makes an angle of θ with the positive x-axis. When θ is an angle of a right triangle, then $\sin(\theta)$ is the ratio of the opposite side with the hypotenuse.

Single variable equation An equation with one variable.

Square number The product when a whole number is multiplied by itself.

Square root A number n is a root of a number m if $n^2 = m$. The square root of 16 is 4 or -4 .

Standard deviation A statistic that measures the dispersion of a sample.

Sum The result of addition.

Symmetry A figure has symmetry when one side is the mirror image of the other side.

System of linear equations Two or more linear equations used to describe a situation.

Tangent A line, curve, or surface meeting another line, curve, or surface at a single point and sharing a common tangent line or tangent plane at that point. The tangent of an

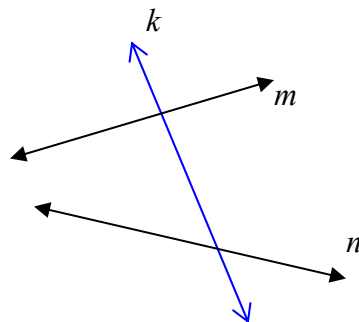
angle θ , $\tan \theta$, is the ratio of $\sin \theta$ to $\cos \theta$. In a right triangle, $\tan \theta$ is the ratio of the opposite side length to the adjacent side length.

Tessellation A repetitive pattern of polygons that fit together with no gaps or overlaps.

Transformation A rule that sets up a one-to-one correspondence between the points in a geometric object (the preimage) and the points in another geometric object (the image). Reflections, rotations, translations, and dilations are particular examples of transformations.

Translation Sliding a figure from one position to another without turning or flipping the figure.

Transversal In geometry, a line (k) that intersects two or more lines (m and n) at different points.

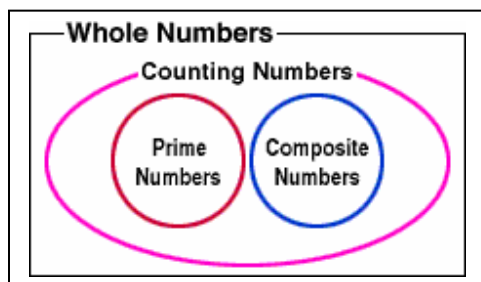


Unit fraction A fraction whose numerator is 1 (e.g., $\frac{1}{3}$, $\frac{1}{2}$, $\frac{1}{5}$).

Unit rate A rate with a denominator of one.

Variable A letter or symbol used to represent one or more numbers in an expression, equation, inequality, or matrix.

Venn diagram A diagram that is used to show relationships between sets.



Vertex A point of intersection of lines, rays, or segments, in a plane or of faces of a solid (corner).

Volume The number of cubic units needed to fill the space occupied by a solid.

Whole number A number that is either a counting number or zero.

Zeros of a function The points at which the value of a function is zero.

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APPENDIX A:

More About the South Dakota Mathematics Revision Committee Members

Roxie Ahlbrecht, 2nd Grade Classroom Teacher, Sioux Falls Public School District 49-5
South Dakota Teacher of the Year
2004 Presidential Award for Excellence in Mathematics and Science Teaching
2002 K-6 Mathematics National Board Certified Teacher, Middle Childhood Generalist,
2001 South Dakota Council of Teachers of Mathematics, Member

Jay Berglund, Secondary Mathematics Teacher, Gettysburg School District
South Dakota Council of Teachers of Mathematics, Member

Steve Caron, Secondary Mathematics Teacher, Aberdeen Public School 6-1
State Level Presidential Awardee for Excellence in Mathematics and Science Teaching,
6 times South Dakota Council of Teachers of Mathematics, Vice President

Mary Jo Christensen, 2nd Grade Teacher, Webster School District
Presidential Award for Excellence In Science and Mathematics, 1999 Elementary
Mathematics

Ellie Cooch, 8th Grade Mathematics Teacher, Spearfish School District
Presidential Award for Excellence in Mathematics and Science Teaching, 7-12
Mathematics 1999 South Dakota Council of Teachers of Mathematics, Member National
Board Certified Teacher, Candidate

James Cutshaw, 7th Grade and Sheltered Mathematics Teacher, Sioux Falls Public
School District 49-5 South Dakota Council of Teachers of Mathematics, Member

Marinela Cyriacks, English Language Learner Instructor, Huron School District 02-2

Carol DeVries, 4th Grade Teacher, Bennett County School District, Bennett County
Education Association, President

Dr. Ralph Erion, Professor of Educational Leadership, South Dakota State University

Kathleen Famestad, Special Education Teacher, Sioux Falls Public School District 49-5
South Dakota Education Association, Leadership Award
Family Matters Award, Sioux Falls Public School District
District Curriculum Committee Member, Language Arts, Science and Social Studies
Nominee for Presidential Award for Excellence in Mathematics and Science Teaching,
2003

Debra Ford, 4th Grade Teacher, Chamberlain School District
District Math Curriculum Committee Member
Who's Who in American Education
Delta Kappa Gamma, Past Treasure

Jean Gomer, 7-12 Mathematics Teacher, Deubrook Area Schools
South Dakota Council of Teachers of Mathematics President 2002-2004
Presidential Award for Excellence in Mathematics and Science Teaching, 7-12
Mathematics, 1997

Doug Heller, 7-8 Mathematics and Reading Teacher, Huron Public Schools
South Dakota Association of Middle Level Educators, Past President
South Dakota Council of Mathematics Teachers, Member
Who's Who in American Education

Kelly Hinds, 4th Grade Teacher, Aberdeen Public Schools
National Board Certified Teacher, Candidate
South Dakota Reading Teacher of the Year, 2001

Allen Hogie, Secondary Mathematics Instructor, Brandon Valley School District
Teacher of the Year Nominee, Brandon Valley School District, 1997
South Dakota Council of Teachers of Mathematics, Member

Charles Holmstrom, High School Mathematics Instructor, Sioux Falls Public School
District 49-5
South Dakota Teachers of Mathematics, President 2004 - 2006
Adjunct Professor, Colorado Technical University, Sioux Falls Branch SDCTM Award
for Distinguished Service in SD Mathematics Education, 2001

Vicki Kapust, Associate Director, Center for the Advancement of Mathematics and
Science Education, Black Hills State University Middle-level Math Specialist and
Professional Development Provider Medallion of Excellence, Natrona County School
District, (Casper, WY)

Leo Keiser, High School Mathematics Instructor, Beresford Schools
Presidential Award for Excellence in Mathematics and Science Teaching, 7-12
Mathematics, 1996
Eisenhower Committee Member for Southeast Area Cooperative
Adjunct Instructor, Kilian Community College
South Dakota Council of Teachers of Mathematics, Member

Susan Kessel, 8th Grade Mathematics Teacher, Meade County School District 46-1
District Math Curriculum Committee Member

Cynthia Kroon, High School Mathematics Instructor, Montrose School District 43-2
Presidential Award for Excellence in Mathematics and Science Teaching, 7-12
Mathematics, 2001
Radio Shack National Teacher Award, 2001
South Dakota Council of Teachers of Mathematics Secretary and Webmaster

Brady Lunde, Middle School Mathematics Teacher, Watertown School District
District Curriculum Committee Member
Past President of Watertown Education Association
Past President of the South Dakota Association of Middle Level Educators
South Dakota Council of Teachers of Mathematics, Member

Jan Martin, Coordinator of Assessment and Evaluation, Todd County School District
Outstanding Research Paper, American Educational Research Association

Diana McCann, Middle School/High School Mathematics, Bon Homme School District
4-2
Presidential Award for Excellence in Mathematics and Science Teaching, K-6
Mathematics, 1993
Distinguished Service Award in Mathematics
Who's Who in American Education, Who's Who in Teaching, Who's Who in American
Women
South Dakota Council for Teachers of Mathematics, Treasurer
State Coordinator for Presidential Awards in South Dakota
South Dakota Council of Teachers of Mathematics, Member

Patricia Moore, 6th Grade Mathematics Teacher, Brookings School District

Dr. Curtis Olson, Chairperson and Associate Professor of Mathematical Sciences,
University of South Dakota
South Dakota Council of Teachers of Mathematics, Newsletter Editor

Michele Perrizo, 4th Grade Teacher, Aberdeen Public Schools

Patricia Reiners, 7th Grade Mathematics Instructor, West Central School District
Mathematics Department Head, 1997-2003
West Central Middle School Teacher of the Year, 2001
West Central School District Teacher of the Year, 1999
South Dakota Council of Teachers of Mathematics, Member

Marie Ritten, Secondary Mathematics Coordinator, Rapid City Area Schools
Advanced Placement Calculus Grader/Consultant, ETS
Golden Apple Award, 2002
South Dakota Council of Teachers of Mathematics, Member
Who's Who Among America's Teachers
Rapid City Schools Math Vertical Team

Kimberly Schara, 6th Grade Mathematics, Science and Reading Teacher, Rapid City Area Schools
Teacher of Distinction, 2002-2003, Rapid City Area Schools
District Mathematics Curriculum Committee
Building Leadership Team

Robert Schuh, High School Mathematics Teacher, McIntosh School District 15-1
Mathematics Mentor
South Dakota Council of Teachers of Mathematics, Member and Past Vice-President

James Stearns, 8-12 Math, Science and Computer Teacher, Bristol School District 18-1
Bristol School District Technology Coordinator
Bristol Education Association, President
South Dakota Science Teachers Association, Newsletter Editor
LRC Math Chairman

Doris Stiles, 4th Grade Teacher, Pierre Public Schools
SD Destination Imagination, State Board Member
SD Association of Gifted Children, State Board Member
Delta Kappa Gamma, Beta Chapter President
Pierre Public Schools Professional Development Committee
South Dakota Council of Teachers of Mathematics, Member

Anne Thompson, Secondary Mathematics Instructor, Sioux Falls Public School District 49-5
Presidential Award for Excellence in Mathematics and Science Teaching, 7-12 Mathematics, 1991

Sandy Ullrich, 2nd Grade Teacher, Aberdeen Public Schools
Delta Kappa Gamma, Past President

Rebecca Umenthum, 6th Grade Mathematics Teacher, Belle Fourche School District
National Board Certified Teacher, Early Adolescence Mathematics, 2001
Presidential Award for Excellence in Math and Science Teaching, Secondary Mathematics, 1995
South Dakota Council of Teachers of Mathematics, Member

Gloria Vavra, 4-8 Teacher, Spring Valley Colony, Wessington Springs School District
Building Principal
South Dakota Council of Teachers of Mathematics, Member
Dakota TESL Member
District Mathematics, Reading and Gates Grant Committees

Nancy Ward, Elementary Mathematics Coordinator, Rapid City Area Schools
Seeing Math Project, Site Facilitator
Strategic Tutoring, Trainer
South Dakota Council of Teachers of Mathematics, Member

Dr. Don Wiken, Associate Professor, College of Education, Dakota State University

**APPENDIX B:
RESOURCES REFERENCED
BY THE SOUTH DAKOTA REVISED MATHEMATICS CONTENT
STANDARDS COMMITTEE**

SD Content Standards for K-12 Mathematics

Technical Guide to the South Dakota Mathematics Standards, 1998
Essential Core Standards for Mathematics, 2002

Other State Content Standards for K-12 Mathematics

Alabama Course of Study, 1997
California Mathematics Content Standards, 1997
Kansas Curriculum Standards for Mathematics, 1999
Massachusetts Mathematics Curriculum Framework, 2000
North Carolina Mathematics Curriculum, 1999
Ohio K-12 Mathematics Content Standards, 2001
Vermont Framework of Standards and Learning Opportunities, 2000

Professional Publications

NCTM Principles and Standards for School Mathematics, 2000
Mathematics Framework for the 2003 National Assessment of Educational Progress,
2002
Every Child Mathematically Proficient: An Action Plan of the Learning First Alliance,
1998
Making Standards Matter, American Federation of Teachers, 2001
Rethinking School Reform, Fordham Foundation, 2003

APPENDIX C: Annotated List of South Dakota Mathematics Resources

Adding It Up: Helping Children Learn Mathematics, Jeremy Kilpatrick, Jane Swafford, Bradford Findell, *Editors*; Mathematics Learning Study Committee, National Research Council (2001) <http://www.nap.edu/catalog/9822.html>

This book explores how students in pre-kindergarten through eighth grade learn mathematics and recommends how teaching, curricula, and teacher education should change to improve mathematics learning during these critical years. It also discusses what is known from research about teaching for mathematics proficiency, focusing on the interactions between teachers and students around educational materials and how teachers develop proficiency in teaching mathematics.

Helping Children Learn Mathematics, Jeremy Kilpatrick and Jane Swafford, *Editors*, Mathematics Learning Study Committee, National Research Council (2002) <http://www.nap.edu/catalog/10434.html>

This report provides comprehensive and reliable information that will guide efforts to improve school mathematics from pre-kindergarten through eighth grade. The authors explain the five strands of mathematical proficiency and discuss the major changes that need to be made in mathematics instruction, instructional materials, assessments, teacher education, and the broader educational system and answers some of the frequently asked questions that emerge regarding mathematics instruction. The report concludes by providing recommended actions for parents and caregivers, teachers, administrators, and policy makers, stressing the importance of all stakeholders working together to ensure a mathematically literate society.

National Council of Teachers of Mathematics <http://www.nctm.org>
NCTM is a public voice of mathematics education, providing vision, leadership, and professional development to support teachers in ensuring mathematics learning of the highest quality for all students. Founded in 1920, NCTM is the world's largest mathematics education organization, with nearly 90,000 members and 250 affiliates throughout the United States and Canada.

Principles and Standards for School Mathematics, NCTM (2002) <http://standards.nctm.org/>

This crucial document updates the messages of NCTM's previous *Standards* and shows how student learning should grow across four grade bands— pre-kindergarten through second grade, third grade through fifth grade, sixth grade through eighth grade, and ninth grade through twelfth grade. It incorporates a clear set of principles and an increased focus on how students' knowledge grows as shown by recent research. It also includes ways to incorporate the use of technology to make mathematics instruction relevant and effective in a technological world.

Illuminations: <http://illuminations.nctm.org/>

The Illuminations site is designed to "illuminate" the NCTM *Principles and Standards for School Mathematics*. The site contains a growing array of Internet resources that can be used to improve the teaching and learning of mathematics. This site is part of the Marcopolo project, funded by MCI Worldcom.

McREL Mid-continent Eisenhower Regional Consortium for Mathematics and Science

<http://www.mcrel.org/erc/>

McREL ERC was established in 1992 by the National Eisenhower Program for Mathematics and Science Education as one of ten regional consortia across the United States. The mission of McREL ERC is to promote and support systemic reform in mathematics and science education in its seven-state region. McREL ERC serves the states of Colorado, Kansas, Missouri, Nebraska, North Dakota, South Dakota, and Wyoming. To facilitate change, McREL ERC collaborates with state departments of education, post-secondary institutions, National Science Foundation-funded initiatives, school districts, and other state and federal agencies.

South Dakota Council of Teachers of Mathematics <http://www.sdctm.org>

The purpose of the South Dakota Council of Teachers of Mathematics is to encourage and maintain an active interest in and an appreciation of mathematics; promote professional growth of mathematics educators; provide a forum for the exchange of views regarding the teaching of mathematics; develop a cohesive link between and to promote the cooperative study of mathematics education at all levels; integrate the study of mathematics into other areas of school curriculum; and relate the study of mathematics to situations in life. SDCTM hosts a conference each February and a symposium each August to help achieve the goals listed above. The Council provides support for South Dakota mathematics teachers, connecting them to each other, and acts as a clearinghouse for information regarding mathematics and mathematics education. Members act individually and collectively as consultants for school districts and for the South Dakota Department of Education.

South Dakota EdWeb: <http://www.sdedweb.com>

Created for South Dakota educators, parents and students, the South Dakota EdWeb provides a user-friendly format to connect to the worldwide web. The Educator section provides links to instructional resources, lesson plans, and on-line activities that have been correlated to the South Dakota core content standards. The Student section provides a safe on-line learning environment with access to learning activities and homework help to assist K-12 students to succeed in their studies. The Parent section provides an index to websites that promote best practices and support parents within all areas of child rearing.